British West Indies Central Sugar Cane Breeding Station, Barbados

# TWENTY-FIRST ANNUAL REPORT

For the Year Ending September 30th, 1954

Advocate Co., Ltd.—Printers.

COMMONWEALTH MYCOLOGICAL INSTITUTE

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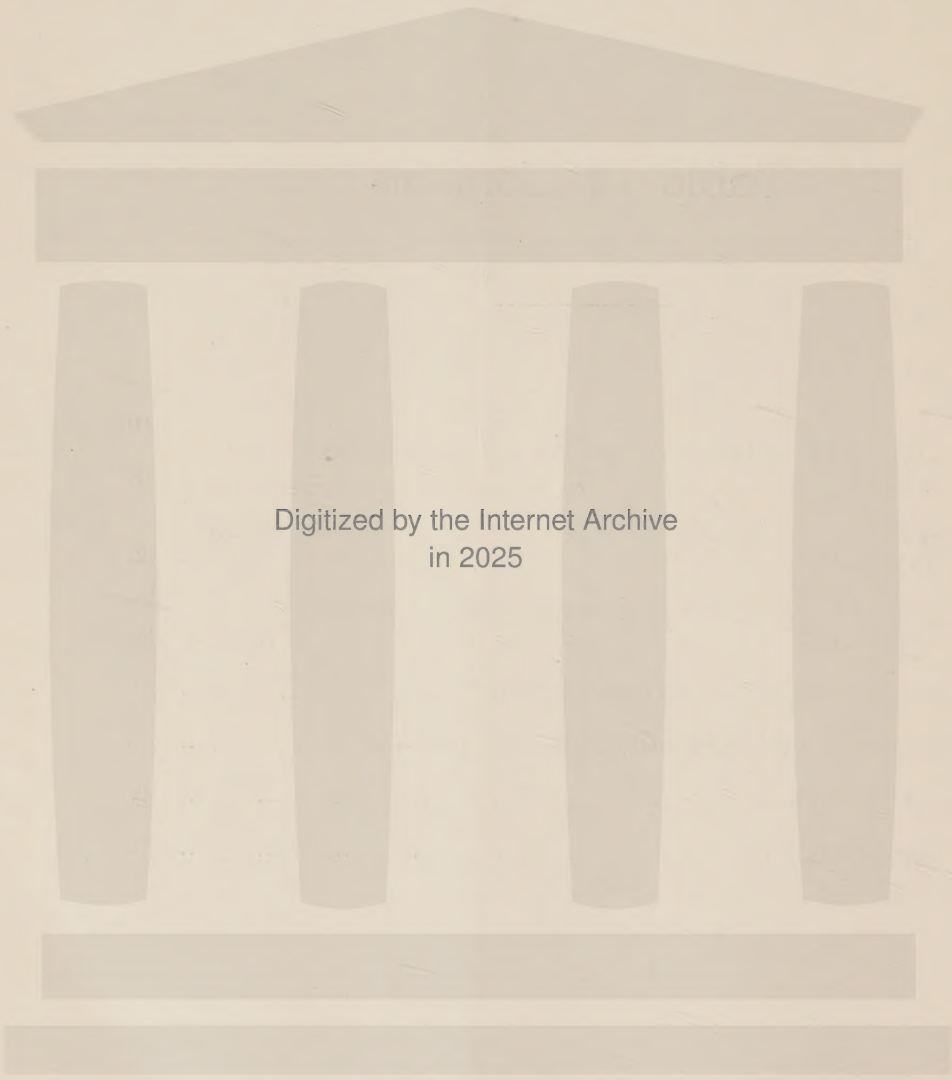

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# British West Indies Central Sugar Cane Breeding Station Barbados.

## TWENTY-FIRST ANNUAL REPORT FOR THE YEAR ENDING THE 30TH SEPTEMBER, 1954

### 1. Sugar Cane Breeding — Seedling Selection and Trials

#### (i) SUGAR CANE BREEDING — B.56″ & B.55′ SERIES

The usual methods were employed in the controlled crossing of various sugar cane varieties at Groves Agricultural Station from October 1953 to January 1954. One hundred and seventeen crosses were made, as well as twenty-one selfs and sib crosses for the Cytogeneticist. Seed from selected crosses was sent to Jamaica and British Guiana.

#### (ii) SEEDLING RAISING, POTTING AND PLANTING IN THE FIELD NURSERY AND IN THE SHORT SEASON FIRST YEAR SEEDLING TRIAL — B.56′ AND B.55′ SERIES

Germination was fairly good on the whole, but as usual some crosses failed to give any seedlings at all, while others gave very few. It is estimated that over ninety-four thousand seedlings germinated, of which twenty-three thousand, five hundred and seventeen were potted singly, and eight thousand, eight hundred and fifty-seven bunches of five to seven seedlings each. Thirteen thousand, eight hundred and thirty-four singles were planted in the Field Nursery, as well as six thousand, nine hundred and eighty-seven bunches, while one thousand, nine hundred and ninety-six seedlings were planted in the B.55′ Series Short Season Trial.

Table I gives, under group heads, a list of the crosses made, the numbers of seedlings germinated, potted and planted in the Field Nursery and in the B.55′ Series Short Season Trial, while Appendix I gives details for all crosses made.

## Table I

*Number of Crosses and Seedlings in each group germinated, potted singly and in bunches, and planted in the Field Nursery B.56′ Series and in the Short Season Seedling Trial B.55′ Series.*

| GROUP | No. of Crosses | No. Germinated | No. Potted Singly | No. Potted in Bunches | No. of Singles Planted in Field Nursery | No. of Bunches Planted in Field Nursery | No. Planted in 1st Year Seedling Trial |
|---|---|---|---|---|---|---|---|
| *S. officinarum x S. spontaneum* | | | | | | | |
| 2nd Nobilisation Glagah | 3 | 4,295 | 581 | — | 309 | — | — |
| 3rd Nobilisation Glagah | 4 | 3,816 | 1,198 | — | 598 | — | 200 |
| 4th Nobilisation Glagah | 2 | 911 | 513 | — | 392 | — | — |
| Noble x Glagah x Local | 4 | 5,398 | 754 | 860 | 532 | 800 | 100 |
| Noble x Glagah x Celebes ... ... | 2 | 19 | 19 | — | — | — | — |
| Noble x Glagah x Local x Celebes ... ... | 2 | 3,006 | 866 | — | 470 | — | — |
| *S. officinarum x S. barberi* | | | | | | | |
| 3rd Nobilisation Chunnee ... ... | 1 | 1 | — | — | — | — | — |
| *S. officinarum x S. spontaneum x S. barberi* | | | | | | | |
| Noble x Glagah x Chunnee ... ... | 11 | 1,112 | 1,101 | — | 752 | — | — |
| Noble x Glagah x Local x Chunnee ... ... | 54 | 53,918 | 13,210 | 6,179 | 7,682 | 4,580 | 1,496 |
| Noble x Chunnee x Celebes ... ... ... | 1 | 41 | 41 | — | 24 | — | — |
| Noble x Glagah x Celebes x Chunnee ... | 4 | 223 | 217 | — | 185 | — | — |
| Noble x Glagah x Local x Celebes x Chunnee | 5 | 14,225 | 2,159 | 1,444 | 1,197 | 1,257 | 100 |
| *S. officinarum x S. spontaneum x S. barberi x S. sinense* | | | | | | | |
| Noble x Local x Chunnee x Sinense ... | 3 | 126 | 114 | — | 104 | — | — |
| Noble x Glagah x Local x Chunnee x Sinense | 12 | 2,163 | 1,238 | 53 | 809 | 50 | 100 |
| *S. officinarum x Erianthus Arundinaceus* | | | | | | | |
| Noble x Erianthus ... | 1 | — | — | — | — | — | — |
| *S. officinarum x S. barberi x Erianthus Arundinaceus* | | | | | | | |
| Noble x Chunnee x Erianthus ... ... | 1 | — | — | — | — | — | — |
| *S. officinarum x S. spontaneum x S. robustum* | | | | | | | |
| Noble x Glagah x Robustum ... ... | 4 | 4,077 | 793 | 381 | 384 | 300 | — |

TABLE I (*Concluded*)

| GROUP | No. of Crosses | No. Germinated | No. Potted Singly | No. Potted in Bunches | No. of Singles Planted in Field Nursery | No. of Bunches Planted in Field Nursery | No. Planted in 1st Year Seedling Trial |
|---|---|---|---|---|---|---|---|
| *S. officinarum x S. spontaneum x S. barberi x S. robustum* | | | | | | | |
| Noble x Glagah x Local x Chunnee x Robustum ... ... ... | 1 | 125 | 125 | — | 96 | — | — |
| Noble x Celebes x Chunnee x Robustum | 1 | 295 | 295 | — | 150 | — | — |
| *S. officinarum x S. barberi x S. robustum* | | | | | | | |
| Noble x Chunnee x Robustum ... ... | 1 | 293 | 293 | — | 150 | — | — |
| TOTALS ... ... | 117 | 94,044 | 23,517 | 8,917 | 13,834 | 6,987 | 1,996 |

## (iii) PLANTING THE FIRST YEAR SEEDLING TRIAL — B.55′ SERIES

This Series was bred in 1952, potted and planted in the Field Nursery in 1953. and from this into the First Year Seedling Trial in October, 1953. All seedlings which were considered to be too thin for commercial purposes, as well as all seedlings which arrowed, were eliminated at this stage, unless they were required for breeding purposes only. This procedure greatly reduces the number of seedlings planted in the First Year Seedling Trial, and saves time and labour during the crop season.

The number of crosses and seedlings in each group planted in the First Year Seedling Trial are given in Table II. Details for each cross are given in Appendix II.

TABLE II

*Number of Crosses and Seedlings in each group planted in the First Year Seedling Trial, B.55′ Series*

| GROUP | No. of Crosses | No. of Seedlings Planted in First Year Trial |
|---|---|---|
| *S. officinarum x S. spontaneum* | | |
| 3rd Nobilisation Local | 1 | 5 |
| 3rd Nobilisation Glagah | 1 | 111 |
| 4th Nobilisation Glagah | 1 | 100 |
| Noble x Glagah x Local | 5 | 811 |
| Noble x Glagah x Celebes | 3 | 155 |
| *S. officinarum x S. spontaneum x S. barberi* | | |
| Noble x Local x Chunnee | 3 | 109 |
| Noble x Glagah x Chunnee | 22 | 2,222 |
| Noble x Glagah x Local x Chunnee | 50 | 5,329 |
| Noble x Glagah x Celebes x Chunnee | 2 | 7 |
| Noble x Glagah x Local x Celebes x Chunnee | 4 | 394 |
| *S. officinarum x S. barberi* | | |
| 3rd Nobilisation Chunnee | 1 | 60 |
| *S. officinarum x S. spontaneum x S. barberi x S. sinense* | | |
| Noble x Local x Chunnee x Sinense | 1 | 20 |
| Noble x Glagah x Chunnee x Sinense | 1 | 100 |
| Noble x Glagah x Local x Chunnee x Sinense | 6 | 209 |
| *S. officinarum x S. spontaneum x S. robustum* | | |
| Noble x Glagah x Celebes x Robustum | 3 | 228 |
| TOTALS | 104 | 9,860 |

## (iv) RESULTS OF REAPING THE FIRST YEAR SEEDLING TRIALS B.54′ SERIES

This series was bred in 1951 and 1952. The long season seedlings were planted in the Field Nursery in May, 1952, and from this into the First Year Seedling Trial in October the same year. The Short Season Trial was planted from pots in May 1953. These trials were cut as plant canes during the past crop season.

As in previous years, the seedlings of each cross were cut, bundled and laid out for inspection. Selection was made initially on appearance and, later, on the usual data obtained from each selected bundle.

Forty-eight selections were made from the Short Season Trial, and two hundred and fifty-two from the Long Season Trial, making a total of two hundred and ninety altogether. Owing to the number of vigorous seedlings coming from these trials in recent years which showed poor juice quality, it was decided to raise the Brix standard required for selection, hence the relatively small number of seedlings selected. Unfortunately, vigour and high sucrose seldom are found in the same cane, but it is just such a combination that is being sought.

Tables III and IV give details of the field and final selections made from each cross.

TABLE III

*First Year Seedling Trials—B.54' Series Field and Final Selections*

| CROSS | No. of Seedlings Cut | No. Field Selected | % Field Selection | No. Final Selection | % Final Selection |
|---|---|---|---|---|---|
| Ba.11569 x B.39274 ... ... | 90 | 4 | 4 | 1 | 1 |
| Ba. 11569 x B.41227 ... ... | 30 | 2 | 7 | — | — |
| Ba.11569 x B.45111 ... ... | 20 | 2 | 10 | — | — |
| B.3353 x P.O.J.2878 ... ... | 80 | — | — | — | — |
| B.3353 x B.4098 ... ... | 70 | 1 | 1 | 1 | 1 |
| B.3365 x B.603 ... ... | 70 | 2 | 3 | 1 | 1 |
| B.3365 x B.34104 ... ... | 80 | 4 | 5 | — | — |
| B.3439 x B.603 ... ... | 70 | — | — | — | — |
| B.3439 x B.3337 ... ... | 120 | 5 | 4 | 3 | 3 |
| B.3439 x B.37193 ... ... | 135 | 23 | 17 | 11 | 8 |
| B.3439 x B.4098 ... ... | 180 | 14 | 8 | 3 | 2 |
| B.3439 x B.45122 ... ... | 60 | 2 | 3 | 1 | 2 |
| B.3439 x Co.281 ... ... | 90 | 2 | 2 | 1 | 1 |
| B.3439 x Co.290 ... ... | 240 | 13 | 5 | 4 | 2 |
| B.3439 x P.O.J.2714 ... ... | 5 | 1 | 20 | — | — |
| B.34102 x B.3337 ... ... | 120 | 6 | 5 | — | — |
| B.35197 x E.K.28 ... ... | 40 | 2 | 5 | 2 | 5 |
| B.35197 x B.50382 ... ... | 20 | — | — | — | — |
| B.35207 x B.48392 ... ... | 130 | 18 | 14 | — | — |
| B.35207 x B.5056 ... ... | 70 | 3 | 4 | 1 | 1 |
| B.35207 x P.O.J.2878 ... ... | 202 | 17 | 8 | 8 | 4 |
| B.35247 x B.4847 ... ... | 80 | 8 | 10 | 1 | 1 |
| B.35247 x Co.419 ... ... | 60 | 5 | 8 | 2 | 3 |
| B.37161 x B.3337 ... ... | 60 | 3 | 5 | — | — |
| B.37161 x B.34104 ... ... | 20 | — | — | — | — |
| B.37161 x B.4098 ... ... | 130 | 13 | 10 | 4 | 3 |
| B.37161 x P.O.J.2878 ... ... | 22 | 2 | 9 | 2 | 9 |
| B.37172 x B.4098 ... ... | 70 | 4 | 6 | 2 | 3 |
| B.37172 x B.41211 ... ... | 100 | 12 | 12 | 4 | 4 |
| B.37172 x B.41227 ... ... | 90 | 11 | 12 | 3 | 3 |
| B.37172 x B.44150 ... ... | 57 | — | — | — | — |
| B.37172 x B.46397 ... ... | 115 | 13 | 11 | 8 | 7 |
| B.37172 x B.47147 ... ... | 80 | 3 | 4 | 1 | 1 |
| B.38272 x B.603 ... ... | 75 | 2 | 3 | — | — |
| B.38272 x B.39220 ... ... | 100 | 7 | 7 | 1 | 1 |
| B.39177 x B.43391 ... ... | 90 | 7 | 8 | 2 | 2 |
| B.39177 x B.46136 ... ... | 70 | 4 | 6 | 2 | 3 |
| B.39207 x B.41227 ... ... | 90 | 8 | 9 | 3 | 3 |
| B.39207 x B.48231 ... ... | 70 | 3 | 4 | — | — |
| B.39207 x P.O.J.2878 ... ... | 80 | 6 | 8 | 1 | 1 |
| B.39254 x B.34104 ... ... | 5 | 1 | 20 | — | — |
| B.4096 x B.35187 ... ... | 10 | — | — | — | — |
| B.40157 x B.34104 ... ... | 30 | 3 | 10 | 1 | 3 |
| B.40157 x B.41227 ... ... | 60 | 5 | 8 | — | — |
| B.4145 x B.34104 ... ... | 230 | 19 | 8 | 6 | 3 |
| B.4145 x B.37175 ... ... | 30 | 4 | 13 | 2 | 7 |
| B.4145 x B.37193 ... ... | 150 | 15 | 10 | 4 | 3 |
| B.4145 x B.4098 ... ... | 510 | 45 | 9 | 21 | 4 |
| B.4145 x Co.281 ... ... | 14 | — | — | — | — |
| B.4145 x P.O.J.2878 ... ... | 20 | — | — | — | — |
| B.41277 x B.41227 ... ... | 55 | 1 | 2 | — | — |
| B.41277 x P.O.J.2878 ... ... | 33 | 3 | 9 | 1 | 3 |
| B.42304 x B.37193 ... ... | 100 | 9 | 9 | — | — |
| B.42304 x B.45151 ... ... | 105 | 16 | 15 | 11 | 10 |
| B.42304 x P.O.J.2878 ... ... | 100 | 4 | 4 | 3 | 3 |
| B.4362 x B.34104 ... ... | 120 | 8 | 7 | 3 | 3 |
| B.4362 x B.37175 ... ... | 60 | 6 | 10 | 4 | 7 |

TABLE III (*Concluded*)

| CROSS | No. of Seedlings Cut | No. Field Selected | % Field Selection | No. Final Selection | % Final Selection |
|---|---|---|---|---|---|
| B.4362 x B.4098 ... ... | 420 | 32 | 7 | 15 | 4 |
| B.4362 x B.43391 ... ... | 110 | 9 | 8 | 4 | 4 |
| B.4362 x Co.419 ... ... | 15 | 1 | 7 | 1 | 7 |
| B.43283 x B.41227 ... ... | 83 | 7 | 8 | 3 | 4 |
| B.43349 x B.41211 ... ... | 150 | 13 | 9 | 2 | 2 |
| B.43349 x B.48125 ... ... | 30 | 1 | 3 | — | — |
| B.4467 x P.O.J.2878 ... ... | 6 | — | — | — | — |
| B.44167 x B.47310 ... ... | 52 | 9 | 17 | — | — |
| B.44167 x P.O.J.2878 ... ... | 80 | 1 | 1 | — | — |
| B.44167 x B.48384 ... ... | 70 | 8 | 11 | 3 | 4 |
| B.44182 x B.45151 ... ... | 35 | 5 | 14 | 1 | 1 |
| B.44341 x B.3337 ... ... | 117 | 11 | 9 | 5 | 4 |
| B.4450 x B.603 ... ... | 40 | 2 | 5 | 1 | 3 |
| B.4558 x B.4098 ... ... | 50 | 5 | 10 | 1 | 2 |
| B.4558 x P.O.J.2878 ... ... | 25 | — | — | — | — |
| B.4596 x B.47198 ... ... | 40 | 1 | 3 | — | — |
| B.45137 x P.O.J.2878 ... ... | 140 | 12 | 9 | 3 | 2 |
| B.45154 x B.34104 ... ... | 42 | 6 | 14 | 3 | 7 |
| B.45154 x B.4098 ... ... | 60 | 9 | 15 | 4 | 7 |
| B.45170 x B.41227 ... ... | 125 | 6 | 5 | 1 | 1 |
| B.45170 x B.41242 ... ... | 20 | 1 | 5 | — | — |
| B.45170 x B.43214 ... ... | 20 | 2 | 10 | 1 | 5 |
| B.45170 x P.O.J.2878 ... ... | 80 | 11 | 14 | 10 | 8 |
| B.45258 x B.41227 ... ... | 60 | — | — | — | — |
| B.45258 x P.O.J.2878 ... | 60 | 8 | 13 | 2 | 3 |
| B.45285 x B.41227 ... ... | 80 | 2 | 3 | 1 | 1 |
| B.4699 x P.O.J.2878 ... ... | 65 | 3 | 5 | 2 | 3 |
| B.46190 x B.4098 ... ... | 60 | — | — | — | — |
| B.4726 x B.45151 ... ... | 80 | 8 | 10 | 3 | 4 |
| B.46199 x B.4098 ... ... | 18 | 2 | 11 | 2 | 11 |
| B.47179 x P.O.J.2878 ... ... | 52 | 2 | 4 | 1 | 2 |
| B.47386 x B.4098 ... ... | 60 | 6 | 10 | 4 | 7 |
| B.47386 x B.45151 ... ... | 40 | 7 | 18 | 2 | 5 |
| B.47399 x B.4098 ... ... | 70 | 13 | 19 | 7 | 10 |
| B.47399 x B.41211 ... ... | 70 | 13 | 19 | 5 | 7 |
| B.50151 x B.41211 ... ... | 50 | 5 | 10 | 1 | 2 |
| B.50213 x B.41211 ... ... | 60 | 6 | 10 | 1 | 2 |
| Co.421 x B.41211 ... ... | 290 | 23 | 8 | 8 | 3 |
| Co.421 x B.46223 ... ... | 129 | 10 | 8 | 6 | 5 |
| Co.421 x B.47198 ... ... | 25 | 1 | 4 | 1 | 4 |
| P.O.J.213 x B.4098 ... ... | 60 | 60 | 10 | 1 | 2 |

TABLE IV

*First Year Seedling Trial—B.54′ Series, Short Season Types—Field and Final Selections*

| CROSS | No. of Seedlings Cut | No. Field Selected | % Field Selection | No. Final Selection | % Final Selection |
|---|---|---|---|---|---|
| B.3439 x B.3337 ... ... | 100 | 4 | 4 | 1 | 1 |
| B.3439 x B.41227 ... ... | 100 | 6 | 6 | — | — |
| B.35207 x P.O.J.2878 ... ... | 100 | 10 | 10 | 5 | 5 |
| B.37161 x B.4098 ... ... | 100 | 5 | 5 | 2 | 2 |
| B.37161 x B.41211 ... ... | 100 | 3 | 3 | 1 | 1 |
| B.37161 x B.47419 ... ... | 100 | 4 | 4 | 3 | 3 |
| B.4145 x B.41211 ... ... | 100 | 17 | 17 | 5 | 5 |
| B.4145 x B.41227 ... ... | 100 | 5 | 5 | 2 | 2 |
| B.4145 x B.47419 ... ... | 100 | 10 | 10 | 5 | 5 |
| B.4362 x B.37193 ... ... | 100 | 4 | 4 | 1 | 1 |
| B.4362 x B.4098 ... ... | 200 | 5 | 3 | 1 | 1 |
| B.4362 x B.42231 ... ... | 100 | 8 | 8 | 4 | 4 |
| B.4362 x B.47419 ... ... | 100 | 10 | 10 | 6 | 6 |
| B.4362 x P.O.J.2878 ... ... | 100 | 1 | 1 | — | — |
| Co.421 x B.4098 ... ... | 200 | 10 | 5 | 2 | 1 |
| Co.421 x B.41211 ... ... | 200 | 12 | 6 | 3 | 2 |
| Co.421 x B.43375 ... ... | 100 | 26 | 26 | 7 | 7 |

As a result of these trials, it has been decided not to repeat any of the following crosses, as the percentage number of seedlings selected from their progenies is not sufficiently large:—

Ba.11569 x B.41227
Ba.11569 x B.45111
B.3353 x P.O.J.2878
B.3353 x B.4098
B.3365 x B.603
B.3365 x B.34104
B.3439 x B.603
B.3439 x B.4098
B.3439 x Co.281
B.34102 x B.3337
B.35197 x B.50382
B.35207 x B.48392
B.35207 x B.5056
B.35247 x B.4847
B.37161 x B.3337
B.37161 x B.34104
B.37172 x B.44150
B.37172 x B.47147
B.38272 x B.603
B.38272 x B.39220
B.39207 x P.O.J.2878
B.39207 x B.48231
B.4096 x B.35187
B.40157 x B.41227
B.41277 x B.41227
B.42304 x B.37193
B.43349 x B.48125
B.44167 x B.47310
B.44167 x P.O.J.2878
B.4558 x P.O.J.2878
B.4596 x B.47198
B.45170 x B.41227
B.45170 x B.41242
B.45258 x B.41227
B.45285 x B.41227
B.46190 x B.4098
P.O.J.213 x B.4098

## (v) PROGRESS WITH SEEDLINGS OF THE B.53′ SERIES

The four hundred and four seedlings of this series were subjected to a minor selection in October 1953, when this number was reduced to two hundred and sixteen. These seedlings were planted in Second Year Seedling Trials at the low rainfall station, Codrington (2 trials) and at the high rainfall stations, Henley and Guinea. These trials will be cut during the 1955 crop season.

As British Guiana is now receiving seed and raising and selecting seedlings for their own conditions, it has been decided to discontinue the Short Season Second Year Seedling Trial.

## (vi) PROGRESS WITH SEEDLINGS OF THE B.52′ SERIES

The seedlings of this series were planted in Second Year Seedling Trials in November 1952, at the low rainfall station, Codrington (2 trials) and in duplicate trials at the high rainfall stations, Clifton Hall and Fisherpond. These trials were cut as plant canes during the past crop season, when twenty-eight selections, were made. Two of these seedlings are for the breeding plots only, while the remainder, after multiplication, will be sent to those colonies for which they were selected. None of the seedlings in the Short Season Trial proved to be better than the standard varieties.

The performances of the Selected seedlings together with those of the standard varieties are given in Tables V and VI.

TABLE V

*Second Year Seedling Trials —Plant Canes*

*Codrington: Cut — 1st—4th February, 1954*

*Fisherpond: Cut — 23rd—26th March, 1954*

| SEEDLING | PARENTAGE | No. of Canes (Rotten) | | % Arrowing | | T.H.R. Brix | | Tons Cane per Acre | |
|---|---|---|---|---|---|---|---|---|---|
| | | Codrington | Fisherpond | Codrington | Fisherpond | Codrington | Fisherpond | Codrington | Fisherpond |
| GROUP I | | | | | | | | | |
| B.37161 ... | Standard ... | 103(0) | 161( 9) | 65 | 31 | 20.5 | 19.3 | 31.87 | 60.54 |
| B.4744 ... | Standard ... | 140(1) | 183( 6) | 10 | 2 | 21.4 | 19.5 | 39.46 | 75.16 |
| B.5212 ... | B.37161 x B.4098 | 112(1) | 152( 7) | — | — | 21.8 | 21.4 | 27.74 | 56.50 |
| B.5213 ... | B.37161 x B.4098 | 112(3) | 149(11) | 1 | 29 | 20.1 | 18 9 | 32.27 | 60.63 |
| GROUP II | | | | | | | | | |
| B.37161 | Standard ... | 101(2) | 156(15) | 32 | 39 | 20.4 | 19.2 | 31.78 | 57.79 |
| B.4744 ... | Standard ... | 130(2) | 146(11) | 33 | 8 | 20.3 | 18.5 | 34.94 | 74.22 |
| B.5253 ... | B.4362 x B.43235 | 113(9) | 140(11) | — | 19 | 19.6 | 18.5 | 33.60 | 61.40 |
| GROUP IV | | | | | | | | | |
| B.37161 ... | Standard ... | 99(0) | 127(11) | 28 | 42 | 20.1 | 18.7 | 31.20 | 47.39 |
| B.4744 ... | Standard ... | 131(3) | 153(15) | 12 | 9 | 20.8 | 18.6 | 40.70 | 67.58 |
| B.5277 .. | B.37161 x B.42231 | 112(0) | 142( 6) | 12 | 49 | 20.6 | 20.0 | 30.62 | 53.66 |
| GROUP V | | | | | | | | | |
| B.37161 ... | Standard ... | 96(4) | 162( 5) | 29 | 70 | 20.9 | 19.3 | 28.42 | 48.68 |
| B.4744 ... | Standard ... | 140(4) | 154( 8) | 7 | 7 | 20.3 | 19.6 | 36.38 | 64.93 |
| B.52107 | B.4145 x B.41227 | 105(2) | 127( 7) | 13 | 5 | 19.8 | 19.7 | 31.87 | 55.90 |
| GROUP VI | | | | | | | | | |
| B.37161 ... | Standard ... | 93(3) | 128(22) | 10 | 39 | 21.1 | 18.5 | 27.46 | 45.49 |
| B.4744 ... | Standard ... | 122(1) | 139(13) | 8 | 12 | 21.5 | 19.4 | 36.77 | 64.59 |
| B.52135 ... | B.37161 x B.34104 | 113(2) | 164(20) | 23 | 37 | 20.8 | 19.2 | 26.50 | 53.41 |
| B.52144 ... | B.37161 x B.4098 | 125(3) | 169(27) | 6 | 25 | 20.8 | 18.1 | 39.36 | 60.54 |
| GROUP VII | | | | | | | | | |
| B.37161 ... | Standard ... | 98(3) | 124(18) | 13 | 26 | 19.8 | 18.3 | 28.70 | 45.92 |
| B.4744 ... | Standard ... | 137(2) | 149( 9) | — | 1 | 20.4 | 17.6 | 39.26 | 66.05 |
| B.52158 ... | B.37161 x B.41227 | 116(5) | 128(15) | 5 | 28 | 20.2 | 18.8 | 26.11 | 56.07 |
| B.52162 ... | B.37161 x B.41227 | 93(1) | 138( 7) | — | 22 | 19.7 | 18.7 | 26.98 | 53.49 |
| B.52178 ... | B.37172 x B.4098 | 100(3) | 130(12) | 60 | 55 | 21.5 | 19.2 | 29.38 | 50.72 |

## Table VI

*Second Year Seedling Trials—Plant Canes*
*Codrington: Cut — 22nd—24th February, 1954*
*Clifton Hall: Cut — 29th March,—1st April, 1954*

| Seedling | Parentage | No. of Canes (Rotten) | | % Arrowing | | Z.H.R. Brix | | Tons Cane per Acre | |
|---|---|---|---|---|---|---|---|---|---|
| | | Codrington | Clifton Hall | Codrington | Clifton Hall | Codrington | Clifton Hall | Codrington | Clifton Hall |
| GROUP VIII | | | | | | | | | |
| B.37161 ... | Standard ... | 104( 4) | 137(19) | 36 | 9 | 20.0 | 18.1 | 38.98 | 52.98 |
| B.4744 ... | Standard ... | 130( 5) | 205(27) | 3 | — | 21.2 | 19.1 | 49.15 | 81.10 |
| B.52184 ... | B.37172 x B.41227 | 89( 6) | 184(24) | 15 | 2 | 20.5 | 18.5 | 25.82 | 62.26 |
| GROUP IX | | | | | | | | | |
| B.37161 ... | Standard ... | 97( 1) | 129(22) | 43 | 21 | 20.9 | 17.7 | 30.43 | 48.85 |
| B.4744 ... | Standard ... | 125( 6) | 174(17) | 18 | — | 21.7 | 17.7 | 42.14 | 87.35 |
| B.52214 ... | B.4145 x B.4098 | 152( 1) | 244(16) | — | 2 | 21.1 | 17.5 | 37.73 | 88.49 |
| B.52222 ... | B.4145 x B.45105 | 110( 1) | 177( 6) | 13 | 2 | 21.2 | 18.2 | 30.43 | 77.06 |
| B.52226* | B.4145 x B.41227 | 93( 3) | 199(25) | 3 | 2 | 20.5 | 16.6 | 35.52 | 79.38 |
| GROUP X | | | | | | | | | |
| B.37161 ... | Standard ... | 93( 6) | 136(13) | 18 | 20 | 21.1 | 17.1 | 32.26 | 56.42 |
| B.4744 ... | Standard ... | 137(13) | 138(20) | — | 1 | 20.9 | 18.6 | 41.09 | 73.26 |
| B.52242 ... | B.4362 x B.4098 | 126( 6) | 185(15) | 10 | 16 | 21.3 | 17.6 | 36.10 | 69.66 |
| B.52253 ... | B.43283 x B.41227 | 142( 7) | 139(23) | 14 | — | 20.2 | 19.1 | 35.81 | 60.97 |
| B.52256 ... | B.43283 x B.41227 | 138( 4) | 181(13) | 8 | 1 | 18.8 | 18.5 | 30.44 | 66.65 |
| B.52257 ... | B.43283 x B.41227 | 135( 2) | 165(15) | 9 | 7 | 21.0 | 18.7 | 36.58 | 59.51 |
| GROUP XI | | | | | | | | | |
| B.37161 | Standard ... | 85( 2) | 108(30) | 23 | 17 | 20.1 | 18.0 | 27.46 | 41.71 |
| B.4744 ... | Standard ... | 133( 4) | 202(16) | 1 | — | 20.3 | 19.3 | 42.14 | 81.36 |
| B.52269* | B.4558 x B.4098 | 101( 5) | 157(13) | 5 | 42 | 20.2 | 18.1 | 32.06 | 54.18 |
| GROUP XII | | | | | | | | | |
| B.37161 ... | Standard ... | 114( 1) | 134(24) | 11 | 10 | 21.0 | 18.2 | 32.16 | 45.75 |
| B.4744 ... | Standard ... | 143( 6) | 176(36) | 4 | 1 | 21.3 | 19.2 | 46.27 | 63.96 |
| B.52298 ... | Co.421 x B.41211 | 139( 1) | 189(22) | 11 | 4 | 20.6 | 19.8 | 40.91 | 69.14 |
| B.52306 ... | Co.421 x B.41211 | 120( 2) | 189( 8) | 38 | 8 | 19.4 | 19.0 | 31.10 | 74.65 |
| B.52313 ... | Co.421 x B.41227 | 130(15) | 224(29) | 92 | 58 | 20.2 | 19.3 | 30.05 | 63.38 |
| B.52315 ... | Co.421 x B.41227 | 138( 5) | 205( 9) | 24 | 9 | 20.5 | 18.7 | 35.14 | 75.25 |
| B.52316 ... | Co.421 x B.41227 | 110( 3) | 148(15) | 6 | 2 | 20.2 | 18.3 | 38.02 | 60.54 |
| B.52321 ... | Co.421 x B.41227 | 132( 1) | 182(26) | 3 | 2 | 21.7 | 18.6 | 38.02 | 64.67 |
| GROUP XIII | | | | | | | | | |
| B.37161 ... | Standard ... | 93( 1) | 93(19) | 28 | 36 | 21.1 | 19.4 | 35.81 | 57.88 |
| B.4744 ... | Standard ... | 121( 2) | 241(16) | 3 | 11 | 21.1 | 20.9 | 42.62 | 103.97 |
| B.52341 ... | B.37172 x B.4098 | 93( 1) | 143( 8) | — | — | 20.2 | 19.8 | 29.86 | 73.44 |
| GROUP XIV | | | | | | | | | |
| B.37161 ... | Standard ... | 95( 9) | 163(17) | 35 | 22 | 20.9 | 17.7 | 29.57 | 56.76 |
| B.4744 ... | Standard ... | 118( 1) | 211(22) | 7 | 4 | 22.1 | 20.2 | 39.46 | 75.94 |
| B.52371 ... | B.43283 x B.41227 | 114( 3) | 172(17) | 37 | 9 | 22.2 | 19.7 | 31.49 | 64.16 |
| B.52389 ... | Co.421 x B.4098 | 120( 4) | 240(16) | 26 | 25 | 21.4 | 17.3 | 34.06 | 77.74 |

*For breeding purposes only.

## (vii) PROGRESS WITH SEEDLINGS OF THE B.51′ SERIES

These seedlings were cut as plant canes in Second Year Seedling Trials during the 1953 crop season. They were cut as first ratoons during the past crop season at the high rainfall stations, Todds and Hothersal, when two seedlings were discarded on their ratoon performance, and one seedling, which had been selected for other Colonies only, gave such an outstanding ratoon performance, that it is being multiplied at Codrington for inclusion in Third Year Seedling Trials.

The performances of these seedlings together with those of the standard varieties are given in Tables VII and VIII.

### Table VII

*Second Year Seedling Trials—First Ratoons*
*Hothersal: Cut — 22nd, 23rd and 26th March, 1954*

| Seedling | Parentage | No. of Canes (Rotten) | % Arrowing | Z.H.R. Brix | Tons Cane per Acre |
|---|---|---|---|---|---|
| GROUP I | | | | | |
| B.37161 ... | Standard ... ... | 144(15) | 11 | 20.9 | 47.82 |
| B.4744 ... | Standard ... ... | 254(26) | — | 21.3 | 64.76 |
| B.5121 ... | Co.421 x B.34104 ... | 188(19) | 17 | 20.7 | 50.14 |
| B.5124 ... | Co.421 x B.4098 ... | 189(14) | 5 | 21.5 | 51.94 |
| B.5126 ... | Co.421 x B.41211 ... | 278( 2) | 29 | 22.3 | 63.38 |
| GROUP II | | | | | |
| B.37161 ... | Standard ... ... | 123( 9) | 29 | 19.5 | 50.22 |
| B.4744 ... | Standard ... ... | 138(30) | — | 20.5 | 45.67 |
| B.5142 ... | B.3439 x B.42231 ... | 102(25) | 34 | 20.8 | 26.66 |
| B.5143 ... | B.3439 x B.42231 ... | 115(10) | 32 | 19.4 | 31.82 |
| B.5149 ... | B.3439 x Co.419 ... | 130(10) | 30 | 20.0 | 38.79 |
| GROUP III | | | | | |
| B.37161 ... | Standard ... ... | 111(14) | 16 | 19.8 | 46.10 |
| B.4744 ... | Standard ... ... | 144(20) | 2 | 19.9 | 56.33 |
| B.5172 ... | B.37161 x B.4098 ... | 127(19) | 23 | 20.0 | 51.00 |
| B.5178 ... | B.37161 x Co.419 ... | 171( 8) | 25 | 20.0 | 50.83 |
| B.5179 ... | B.37161 x P.O.J.2878 | 83(15) | 1 | 20.4 | 34.74 |
| GROUP IV | | | | | |
| B.37161 ... | Standard ... ... | 127(30) | 13 | 19.5 | 50.83 |
| B.4744 ... | Standard ... ... | 138(33) | 3 | 20.8 | 47.47 |
| B.5192 ... | B.4111 x B.4098 ... | 150(19) | 5 | 20.4 | 46.01 |
| B.51105 ... | B.42304 x B.37193 ... | 154(20) | 4 | 20.2 | 46.35 |
| GROUP V | | | | | |
| B.37161 ... | Standard ... ... | 140(14) | 8 | 20.1 | 41.02 |
| B.4744 ... | Standard ... ... | 141(40) | 6 | 21.0 | 42.74 |
| B.51116 ... | B.4362 x B.34104 ... | 192(14) | 1 | 22.4 | 47.21 |
| B.51122 ... | B.4362 x B.41211 ... | 163(29) | 58 | 20.8 | 39.30 |
| B.51129 ... | B.45170 x B.41227 ... | 178(20) | 14 | 21.4 | 53.58 |
| B.51131 ... | B.45170 x B.41227 ... | 212(23) | 10 | 21.7 | 47.99 |
| B.51134 ... | Co.421 x B.37193 ... | 194(10) | 17 | 21.4 | 47.04 |
| GROUP VI | | | | | |
| B.37161 ... | Standard ... ... | 104(23) | 22 | 21.6 | 53.23 |
| B.4744 ... | Standard ... ... | 159(13) | 14 | 21.0 | 59.25 |
| B.51148 ... | B.3439 x B.35269 ... | 131(13) | 55 | 20.0 | 54.18 |
| B.51152 ... | B.3439 x B.37261 ... | 82(27) | 29 | 21.6 | 29.50 |
| B.51156 ... | B.3439 x B.38192 ... | 107(25) | — | 20.5 | 44.20 |
| B.51167 ... | B.3439 x Co.290 ... | 56(46) | 40 | 20.5 | 19.87 |
| B.51168 ... | B.3439 x Co.290 ... | 105(38) | — | 21.1 | 39.99 |

Nearly all of the varieties suffered to a greater or lesser extent from rat damage.

## Table VIII

*Second Year Seedling Trials—First Ratoons*

*Todds: Cut — 10th—12th March, 1954*

| Seedling | Parentage | No. of Canes (Rotten) | % Arrowing | Z.H.R. Brix | Tons Cane per Acre |
|---|---|---|---|---|---|
| GROUP VII | | | | | |
| B.37161 ... | Standard ... ... | 145(3) | 29 | 17.6 | 46.01 |
| B.4744 ... | Standard ... ... | 159(2) | 14 | 18.3 | 49.97 |
| B.51183 ... | B.35197 x B.3337 ... | 187(3) | 57 | 18.5 | 52.55 |
| B.51190 ... | B.35207 x P.O.J.2878 | 165(6) | 81 | 17.3 | 47.21 |
| B.51192 ... | B.35207 x P.O.J.2878 | 150(2) | 39 | 17.9 | 40.59 |
| GROUP VIII | | | | | |
| B.37161 ... | Standard ... ... | 132(3) | 31 | 18.7 | 43.52 |
| B.4744 ... | Standard ... ... | 229(3) | 10 | 17.6 | 69.23 |
| B.51211 ... | B.37161 x B.34104 ... | 147(2) | 4 | 18.3 | 39.30 |
| GROUP IX | | | | | |
| B.37161 ... | Standard ... ... | 146(6) | 23 | 17.7 | 43.43 |
| B.4744 ... | Standard ... ... | 161(5) | 6 | 17.8 | 54.87 |
| B.51259 ... | B.40272 x Co.290 ... | 152(7) | 70 | 16.6 | 44.89 |
| GROUP X | | | | | |
| B.37161 ... | Standard ... ... | 161(3) | 23 | 18.6 | 49.19 |
| B.4744 ... | Standard ... ... | 176(4) | 2 | 18.0 | 63.64 |
| B.51311 ... | B.4145 x B.41211 ... | 162(2) | 24 | 18.1 | 53.84 |
| GROUP XI | | | | | |
| B.37161 ... | Standard ... ... | 146(4) | 31 | 18.8 | 50.83 |
| B.4744 ... | Standard ... ... | 191(6) | 5 | 19.3 | 61.15 |
| B.51321 ... | B.4145 x B.42231 ... | 107(4) | 26 | 18.7 | 36.12 |
| GROUP XII | | | | | |
| B.37161 ... | Standard ... ... | 154(4) | 37 | 18.5 | 48.76 |
| B.4744 ... | Standard ... ... | 173(2) | 5 | 18.8 | 60.11 |
| B.51341 ... | B.44341 x B.3337 ... | 174(3) | 3 | 19.8 | 50.40 |
| B.51353 ... | Co.421 x B.41211 ... | 150(4) | 6 | 17.1 | 56.59 |
| B.51355 ... | Co.421 x B.41211 ... | 217(3) | 4 | 17.4 | 67.34 |
| B.51360 ... | Co.421 x B.41211 ... | 200(4) | 8 | 17.5 | 70.09 |
| B.51367 ... | Co.421 x B.41211 ... | 116(3) | 14 | 18.5 | 40.33 |
| GROUP XIII | | | | | |
| B.37161 ... | Standard ... ... | 121(7) | 28 | 18.6 | 36.12 |
| B.4744 ... | Standard ... ... | 183(9) | 4 | 19.3 | 59.34 |
| B.51374 ... | Co.421 x B.41211 ... | 132(1) | 73 | 18.1 | 35.52 |

## (viii) PROGRESS WITH SEEDLINGS OF THE B.50′ AND EARLIER SERIES

### Third Year and Select Seedling Trials

### A. The Seedlings Tested

#### 1. *Third Year Seedlings Trial*

*Plant Canes:*— B.49119, B.5011, B.5028, B.5037, B.5047, B.5098, B.50109, B.50112, B.50115, B.50153, B.50166, B.50210, B.50267, B.50268, B.50275, B.50311, B.50347 and B.50377.

*First Ratoons:*— B.4906, B.4942, B.4956, B.4966, B.49122, B.49186, B.49198, B.49229, B.49257, B.49301, B.49309, B.49311, B.49346, B.49353, B.49355 and B.49376.

*Third Ratoons:*— B.4466, B.4738, B.4743, B.4744, B.4747, B.4764, B.4781, B.4788, B.47135, B.47147, B.47151, B.47162, B.47204, B.47214, B.47216, B.47217, B.47258, B.47314, B.47379, B.47380, B.47397, B.47419.

#### 2. *Select Seedling Trials*

*Plant Canes:*— B.37161, B.46364, B.4738, B.4744, B.47380, B.47419, B.49119.

*First Ratoons:*— B.37161, B.41211, B.4744, B.47419 and B.45151.

### B. An Ecological Classification of the Trials

This classification was proposed by Turner after a study of the sugar cane soils of the British West Indian Colonies, and is as follows:—

*Group I :*— Soils with a natural tilth and free natural drainage which require neither to be ploughed nor drained.

*Group II :*— Soils with a tilth which can be improved by ploughing, but which do not require to be drained.

#### (a) Low Rainfall Areas

*Third Year Seedling Trials*

| | |
|---|---|
| Plant Canes ... ... ... ... ... | Bromefield |
| First Ratoons ... ... ... ... ... | Bushy Park |

*Select Seedling Trials*

| | |
|---|---|
| Plant Canes ... ... ... ... ... | The Hope |
| First Ratoons ... ... ... ... ... | Crab Hill |

(b) Intermediate Rainfall Areas

*Third Year Seedling Trials*

| | |
|---|---|
| Plant Canes ... ... ... ... ... | Hanson and Belle |
| First Ratoons ... ... ... ... | Pickerings and Belle |
| Third Ratoons ... ... ... ... | Wotton |

*Select Seedling Trials*

| | |
|---|---|
| Plant Canes ... ... ... ... ... | Friendship and Hannays |
| First Ratoons ... ... ... ... | Searles and Hampton |

(c) High Rainfall Areas

*Third Year Seedling Trials*

| | |
|---|---|
| Plant Canes ... ... ... ... ... | Portland & Wakefield |
| First Ratoons ... ... ... ... | Portland and Mt. Wilton |
| Third Ratoons ... ... ... ... | Easy Hall |

*Select Seedling Trials*

| | |
|---|---|
| Plant Canes ... ... ... ... ... | Drax Hall and Mt. Brevitor |
| First Ratoons ... ... ... ... | Applewhaites and Bowmanston |

*Group III*:— Soils which require to be drained but are preferably left unploughed.

*Group IV*:— Soils with a poor natural tilth in which a tilth can be created by ploughing, but which require to be drained to maintain their tilth.

(b) Intermediate Rainfall Areas

*Third Year Seedling Trials*

| | |
|---|---|
| Plant Canes ... ... ... ... ... | Carrington |
| First Ratoons ... ... ... ... | Carrington |

*Select Seedling Trials*

| | |
|---|---|
| Plant Canes ... ... ... ... ... | Bulkeley |
| First Ratoons ... ... ... ... | Bulkeley |

## C. Rainfall During the Seasons

Table IX

| Month | 1931—32 to 1950—51 | 1951—52 | 1952—53 | 1953—54 |
|---|---|---|---|---|
| January ... ... ... ... | 3.23 | 3.45 | 0.65 | 3.35 |
| February ... ... ... ... | 1.54 | 14.35 | 0.58 | 2.11 |
| March ... ... ... ... | 1.63 | 2.28 | 2.64 | 2.04 |
| April ... ... ... ... | 1.96 | 7.50 | 2.84 | 0.91 |
| May ... ... ... ... | 3.04 | 2.07 | 3.04 | 2.44 |
| June ... ... ... ... | 4.99 | 7.39 | 5.38 | 5.28 |
| July ... ... ... ... | 6.65 | 6.03 | 5.67 | 9.52 |
| August ... ... ... ... | 7.09 | 12.89 | 3.47 | 8.74 |
| September ... ... ... ... | 7.68 | 10.86 | 7.21 | 11.15 |
| October ... ... ... ... | 8.27 | 4.37 | 9.07 | 4.93 |
| November ... ... ... ... | 9.07 | 10.80 | 7.48 | 10.18 |
| December ... ... ... ... | 4.49 | 8.65 | 3.54 | 5.53 |
| January ... ... ... ... | 3.28 | 0.65 | 3.35 | 4.84 |
| February ... ... ... ... | 2.19 | 0.58 | 2.11 | 2.50 |
| March ... ... ... ... | 1.69 | 2.64 | 2.04 | 1.83 |
| Totals ... ... ... | 66.80 | 94.51 | 59.07 | 75.35 |

Rainfall during the growing period was slightly above average, and apart from a comparatively dry spell during the month of October, was fairly well distributed. Heavy yields of cane were obtained, and the second largest crop in the Island's history, the equivalent of 178,960 tons of sugar, was produced. This was the sixth successive year in which weather conditions have been favourable, so it has not yet been possible to observe the effects of adverse weather conditions on some of the newer varieties. Planting recommendations for these varieties will therefore have to be cautious until their reaction to more unfavourable weather conditions is known.

Table X

*Soil Type:—Group II(a) Third Year Seedling Trials—Plant Canes*

*Bromefield — Cut — 16th and 17th February, 1954*

| Variety | Tons Cane per Acre | Z.H.R. Brix | % Sucrose in Juice | Purity | No. of Rotten Canes per Plot |
|---|---|---|---|---|---|
| B.37161 ... | 39.53 | 18.5 | 18.2 | 90.4 | 2 |
| B.4744 ... ... | 49.28 | 19.2 | 17.1 | 90.6 | 5 |
| B.49119 ... | 48.41 | 19.6 | 17.4 | 90.4 | 3 |
| B.5011 ... ... | 37.04 | 20.7 | 18.2 | 89.4 | 4 |
| B.5028 ... ... | 42.00 | 18.9 | 18.0 | 90.9 | 2 |
| B.5037 ... ... | 40.38 | 19.6 | 18.8 | 90.8 | 3 |
| B.5047 ... ... | 36.98 | 19.0 | 17.3 | 87.7 | 6 |
| B.5098 ... ... | 44.86 | 18.2 | 15.5 | 88.3 | 5 |
| B.50109 ... | 39.23 | 18.4 | 16.9 | 90.9 | 4 |
| B.50112 ... | 42.23 | 19.9 | 17.5 | 91.0 | 3 |
| B.50115 ... | 39.00 | 17.8 | 14.6 | 86.2 | 7 |
| B.50153 ... | 40.11 | 19.6 | 18.1 | 91.0 | 8 |
| B.50166 ... | 38.33 | 17.9 | 16.5 | 90.6 | 4 |
| B.50210 ... | 41.30 | 19.1 | 17.0 | 88.7 | 3 |
| B.50267 ... | 40.73 | 19.2 | 17.3 | 89.8 | 8 |
| B.50268 ... | 38.58 | 18.7 | 15.6 | 87.6 | 8 |
| B.50275 ... | 45.29 | 18.9 | 16.4 | 88.7 | 6 |
| B.50311 ... | 41.73 | 18.8 | 17.0 | 88.7 | 4 |
| B.50347 ... | 47.51 | 18.8 | 16.1 | 88.9 | 2 |
| B.50377 ... | 38.91 | 20.8 | 18.9 | 89.0 | 2 |

A difference of $\pm$ 4.02 tons cane per acre may be considered significant.

In this trial, B.4744 gave the heaviest yield of plant cane followed closely by B.49119. Both of these varieties were significantly better than any of the other varieties tried, with the exception of B.5098 and B.50275. However, the juice qualities of the latter varieties were rather poor, although none of the varieties at this stage of the season could be considered to be ripe. B.50377 gave the best quality juice, but is badly handicapped by the freedom with which it flowers, and which greatly reduces its yield of cane. Juice purities in all varieties were exceptionally high for so early in the season.

TABLE XI

*Soil Type:—Group II(a) Select Seedling Trials—Plant Canes*

*The Hope — Cut — 15th February, 1954*

| VARIETY | TONS CANE PER ACRE | TONS SUGAR PER ACRE | % SUCROSE IN CANE | PURITY | NO. OF ROTTEN CANES PER PLOT |
|---|---|---|---|---|---|
| B.37161 ... | 32.56 | 4.85 | 14.9 | 92.5 | 17 |
| B.4738 ... ... | 34.92 | 5.36 | 15.4 | 90.9 | 13 |
| B.4744 ... ... | 38.37 | 6.02 | 15.7 | 90.8 | 13 |
| B.47419 ... | 38.20 | 5.82 | 15.2 | 90.5 | 17 |

The differences between the mean yields of cane and sugar cannot be shown to be significant.

In this trial, B.4744 gave the heaviest yields of cane and sugar, followed by B.47419, B.4738 and B.37161. There was a very wide variation in yield from plot to plot, and the differences between mean yields cannot be shown to be significant. B.4744 gave the best quality juice as judged by the sucrose in cane, and B.37161 the poorest. However, B.37161 had the highest purity.

TABLE XII

*Soil Type:—Group II(a) Select Seedling Trials—First Ratoons*

*Crab Hill — Cut — 24th February, 1954*

| VARIETY | TONS CANE PER ACRE | | TONS SUGAR PER ACRE | | % SUCROSE IN CANE | | QUOTIENT OF PURITY | | NO. OF ROTTEN CANES PER PLOT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. |
| B.37161 ... | 36.22 | 34.96 | 5.80 | 5.18 | 16.0 | 14.8 | 90.4 | 90.8 | 14 | 12 |
| B.41211 ... | 39.17 | 41.12 | 6.25 | 5.97 | 16.0 | 15.2 | 87.6 | 88.9 | 17 | 13 |
| B.4744 ... | 35.82 | 35.61 | 5.82 | 5.71 | 16.3 | 16.0 | 88.3 | 90.5 | 11 | 13 |
| B.47419 ... | 33.18 | 35.35 | 5.46 | 5.65 | 16.5 | 16.0 | 88.7 | 90.3 | 29 | 15 |

The differences between mean yields of cane and sugar for both trials cannot be shown to be significant:—

In this trial, B.41211 gave the heaviest yield of cane and sugar, followed by B.4744, B.47419 and B.37161. However, the differences between the mean yields of cane and sugar are not significant at odds of 20.1: B.4744 and B.47419 had the best sucrose content, and B.37161 the best juice purity.

TABLE XIII

*Soil Type:—Group II(b) Third Year Seedling Trials—Plant Canes*

*Hanson — Cut —10th and 11th March, 1954*

*Belle — Cut — 12th and 15th March, 1954*

| VARIETY | TONS CANE PER ACRE | | Z.H.R. BRIX | | % SUCROSE IN JUICE | | PURITY | | NO. OF ROTTEN CANES PER PLOT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Hanson | Belle | Hanson | Belle | Hanson | Belle | Hanson | Belle | Hanson | Belle |
| B.37161 ... | 40.35 | 40.84 | 20.5 | 20.4 | 17.9 | 18.7 | 91.1 | 89.7 | 11 | 14 |
| B.4744 ... | 53.65 | 47.38 | 20.5 | 21.3 | 18.6 | 18.0 | 90.4 | 87.7 | 26 | 19 |
| B.49119 ... | 45.42 | 49.24 | 21.0 | 21.3 | 19.0 | 19.2 | 89.8 | 89.2 | 26 | 11 |
| B.5011 ... | 38.80 | 38.33 | 21.1 | 21.5 | 19.2 | 18.9 | 89.1 | 87.7 | 39 | 12 |
| B.5028 ... | 41.60 | 36.78 | 20.3 | 21.1 | 17.9 | 18.5 | 89.4 | 88.0 | 27 | 17 |
| B.5037 ... | 41.32 | 42.79 | 21.1 | 20.9 | 18.5 | 19.1 | 90.9 | 89.3 | 14 | 16 |
| B.5047 ... | 41–36 | 39.27 | 20.4 | 20.4 | 18.2 | 18.0 | 90.8 | 87.3 | 26 | 15 |
| B.5098 ... | 43.75 | 40.06 | 19.3 | 19.6 | 18.2 | 16.8 | 89.8 | 84.8 | 20 | 13 |
| B.50109 ... | 29.58 | 36.02 | 20.9 | 20.1 | 18.3 | 18.4 | 90.3 | 89.7 | 109 | 60 |
| B.50112 ... | 47.28 | 43.07 | 20.7 | 21.1 | 19.2 | 18.3 | 92.1 | 88.0 | 14 | 15 |
| B.50115 ... | 40.88 | 41.26 | 18.4 | 18.5 | 16.1 | 15.5 | 86.7 | 84.5 | 17 | 13 |
| B.50153 ... | 41.92 | 40.34 | 21.3 | 21.2 | 19.0 | 19.7 | 90.0 | 91.4 | 21 | 30 |
| B.50166 ... | 45.51 | 40.59 | 19.4 | 20.3 | 17.4 | 17.9 | 88.8 | 89.2 | 25 | 19 |
| B.50210 ... | 45.38 | 40.95 | 20.4 | 20.1 | 18.8 | 17.9 | 90.4 | 87.6 | 16 | 10 |
| B.50267 ... | 46.26 | 42.79 | 21.0 | 21.8 | 18.3 | 18.7 | 88.6 | 89.1 | 15 | 17 |
| B.50268 ... | 48.21 | 38.91 | 20.5 | 20.6 | 17.8 | 17.1 | 88.7 | 87.0 | 73 | 91 |
| B.50275 ... | 39.42 | 38.01 | 20.5 | 21.4 | 17.7 | 19.0 | 89.3 | 90.5 | 23 | 28 |
| B.50311 ... | 40.62 | 42.98 | 20.3 | 20.5 | 17.9 | 17.7 | 90.3 | 88.6 | 11 | 11 |
| B.50347 ... | 45.02 | 46.02 | 20.6 | 20.3 | 17.8 | 17.0 | 89.4 | 84.9 | 13 | 13 |
| B.50377 ... | 40.62 | 37.64 | 21.6 | 21.5 | 19.7 | 20.5 | 91.7 | 91.5 | 15 | 19 |

The following differences between mean yields may be considered significant:—

Hanson ± 4.24 tons cane per acre.
Belle ± 4.00 tons cane per acre.

At Hanson, B.4744 gave the heaviest yield of plant cane, followed by B.50268, B.50112, B.50267, B.50166, B.49119, B.50210 and B.50347. All of these varieties proved to be significantly better than B.37161. B.50377 gave as good a yield as B.37161 and has an excellent juice, but flowers too freely in Barbados to be of any use as a commercial variety.

At the Belle, B.49119 gave the heaviest yield of plant cane, followed by B.4744 and B.50347. All three of these varieties significantly outyielded B.37161 on yield of cane. B.49119 has quite a good juice, but the juice quality of B.50347 is inclined to be poor and in a season where ripening conditions were not so good there would certainly be complaints from the factories if this variety were grown. The juice quality of B.50377 was again outstanding.

## Table XIV

*Soil Type:—Group II(b) Third Year Seedling Trials—First Ratoons*

*Pickerings — Cut — 18th and 19th February, 1954*

| Variety | Tons Cane per Acre | | Z.H.R. Brix | | % Sucrose in Juice | | Purity | | No. of Rotten Canes per Plot | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. |
| B.37161 ... | 43.08 | 38.84 | 22.5 | 19.4 | 19.2 | 16.5 | 88.9 | 90.9 | 16 | 6 |
| B.41211 ... | 41.89 | 47.78 | 21.9 | 19.2 | 17.3 | 15.4 | 80.8 | 86.5 | 29 | 8 |
| B.4744 ... | 51.17 | 45.82 | 22.7 | 19.3 | 18.4 | 17.1 | 84.2 | 90.2 | 24 | 6 |
| B.47419 ... | 40.21 | 38.72 | 22.4 | 19.4 | 19.9 | 17.2 | 87.8 | 88.9 | 20 | 4 |
| B.4906 ... | 41.39 | 38.43 | 23.6 | 21.5 | 18.8 | 18.6 | 79.4 | 88.9 | 11 | 6 |
| B.4942 ... | 46.54 | 38.40 | 22.7 | 19.6 | 20.1 | 18.1 | 86.4 | 90.4 | 40 | 10 |
| B.4956 ... | 33.44 | 37.98 | 21.3 | 18.2 | 18.1 | 15.1 | 86.3 | 88.1 | 62 | 16 |
| B.4966 ... | 43.90 | 42.72 | 21.9 | 19.2 | 16.9 | 16.9 | 78.1 | 89.3 | 35 | 3 |
| B.49122 ... | 34.65 | 36.30 | 21.4 | 18.5 | 18.0 | 15.1 | 85.2 | 88.6 | 25 | 6 |
| B.49186 ... | 35.40 | 35.70 | 22.5 | 19.6 | 19.6 | 16.4 | 86.1 | 88.3 | 45 | 9 |
| B.49198 ... | 47.22 | 39.82 | 20.7 | 18.3 | 14.1 | 15.1 | 70.8 | 84.4 | 17 | 4 |
| B.49229 ... | 37.90 | 30.32 | 23.6 | 20.2 | 21.8 | 18.6 | 90.6 | 92.5 | 21 | 7 |
| B.49257 ... | 36.72 | 44.69 | 19.1 | 17.3 | 14.5 | 14.8 | 73.9 | 87.7 | 72 | 18 |
| B.49301 ... | 37.20 | 36.18 | 22.1 | 19.5 | 16.7 | 16.7 | 77.1 | 87.6 | 14 | 7 |
| B.49309 ... | 33.14 | 29.15 | 22.6 | 19.8 | 21.2 | 17.3 | 90.2 | 89.6 | 15 | 7 |
| B.49311 ... | 44.70 | 35.44 | 23.2 | 18.5 | 22.2 | 15.8 | 91.6 | 87.9 | 22 | 4 |
| B.49346 ... | 43.39 | 38.22 | 20.3 | 18.0 | 14.6 | 14.2 | 69.5 | 80.2 | 45 | 11 |
| B.49353 ... | 39.30 | 34.79 | 23.3 | 19.9 | 19.3 | 17.2 | 87.3 | 90.6 | 19 | 6 |
| B.49355 ... | 34.46 | 31.15 | 22.9 | 19.7 | 17.1 | 17.1 | 77.3 | 88.9 | 15 | 7 |
| B.49376 ... | 48.17 | 35.44 | 20.9 | 18.5 | 17.8 | 14.9 | 83.7 | 87.0 | 29 | 1 |

The following differences between mean yields may be considered significant:—

| | |
|---|---|
| Plant Canes | ± 6.39 tons cane per acre |
| First Ratoons | ± 6.01 tons cane per acre. |

In the ratoon trial at Pickerings, B.41211 gave the heaviest yield of cane, followed by B.4744. Both of these varieties significantly outyielded B.37161. B.49257 also gave a good yield of ratoon cane, but was beginning to rot, and the juice quality was very poor. None of the varieties of the B.49′ series appears to be worthy of further trial in Barbados.

TABLE XV

*Soil Type:—Group II(b) Third Year Seedling Trials—First Ratoons*

*Belle — Cut — 8th and 9th April, 1954*

| VARIETY | TONS CANE PER ACRE | | Z.H.R. BRIX | | % SUCROSE IN JUICE | | PURITY | | No. OF ROTTEN CANES PER PLOT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. |
| B.37161 ... | 41.52 | 51.12 | 20.2 | 21.4 | 17.4 | 18.6 | 86.2 | 90.9 | 15 | 15 |
| B.4098 ... | 39.94 | 43.18 | 21.5 | 21.7 | 17.1 | 18.9 | 83.5 | 87.5 | 9 | 22 |
| B.41211 ... | 44.54 | 53.30 | 21.5 | 21.4 | 17.7 | 18.1 | 83.5 | 85.7 | 7 | 18 |
| B.4744 ... | 47.92 | 53.49 | 20.6 | 21.8 | 18.0 | 18.3 | 85.8 | 88.1 | 14 | 15 |
| B.47419 ... | 41.22 | 50.63 | 23.9 | 21.4 | 17.9 | 19.2 | 85.5 | 89.4 | 29 | 23 |
| B.4906 ... | 36.36 | 41.97 | 22.0 | 23.3 | 20.0 | 20.5 | 83.8 | 89.7 | 6 | 15 |
| B.4942 ... | 40.75 | 39.93 | 19.3 | 22.4 | 19.8 | 19.6 | 86.7 | 88.4 | 20 | 11 |
| B.4956 ... | 37.64 | 36.36 | 20.9 | 19.8 | 15.7 | 16.0 | 83.2 | 85.8 | 23 | 24 |
| B.4966 ... | 39.58 | 47.04 | 20.3 | 22.0 | 18.1 | 18.2 | 82.1 | 85.9 | 8 | 13 |
| B.49122 ... | 38.88 | 41.05 | 20.9 | 19.9 | 17.5 | 18.3 | 86.5 | 89.5 | 13 | 20 |
| B.49186 ... | 36.95 | 33.92 | 20.0 | 21.2 | 17.7 | 18.5 | 83.4 | 86.0 | 9 | 17 |
| B.49198 ... | 41.49 | 47.72 | 21.8 | 19.8 | 16.7 | 15.0 | 80.3 | 76.1 | 7 | 10 |
| B.49229 ... | 32.34 | 37.35 | 18.6 | 22.9 | 20.8 | 20.4 | 89.0 | 91.1 | 13 | 11 |
| B.49257 ... | 47.50 | 41.06 | 21.2 | 19.2 | 14.5 | 16.6 | 80.9 | 87.3 | 19 | 36 |
| B.49301 ... | 36.58 | 46.48 | 21.1 | 21.9 | 17.5 | 19.4 | 83.4 | 86.0 | 10 | 14 |
| B.49309 ... | 38.32 | 37.15 | 22.1 | 21.9 | 18.9 | 19.4 | 86.3 | 90.3 | 16 | 20 |
| B.49311 ... | 38.45 | 41.17 | 20.0 | 21.6 | 19.8 | 20.1 | 87.4 | 90.1 | 16 | 9 |
| B.49346 ... | 42.25 | 43.27 | 21.3 | 19.6 | 16.0 | 15.9 | 78.5 | 80.6 | 14 | 19 |
| B.49353 ... | 35.68 | 43.38 | 19.8 | 21.5 | 17.8 | 19.1 | 86.1 | 91.1 | 24 | 16 |
| B.49355 ... | 32.73 | 32.86 | 21.7 | 21.5 | 15.1 | 18.9 | 79.3 | 82.5 | 14 | 18 |

The following differences between mean yields may be considered significant:—

Plant Canes ± 6.14 tons cane per acre.
First Ratoons ± 4.68 tons cane per acre.

In the First Ratoon trial at the Belle, B.4744 gave the heaviest yield of ratoon cane closely followed by B.41211, B.37161 and B.47419. None of the varieties of the B.49′ series in these trials gave yields approaching the standard varieties mentioned above and they will not be tested further.

## Table XVI

*Soil Type:—Group II(b) Third Year Seedling Trials—Third Ratoons*

*Wotton — Cut — 20th and 21st April, 1954*

| Variety | Tons Cane per Acre | | | | Z.H.R. Brix | | | | % Sucrose in Juice | | | | Purity | | | | No. of Rotten Canes per Plot | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. |
| | | | | | | | | | | | | | * | * | | | | | | |
| B.37161 ... | 43.54 | 37.93 | 31.72 | 32.20 | 21.0 | 21.8 | 20.7 | 22.2 | 17.9 | 18.0 | 17.9 | 19.4 | — | — | 88.7 | 91.0 | 14 | 11 | 8 | 14 |
| B.4098 ... | 40.22 | 35.90 | 33.87 | 34.67 | 21.9 | 22.5 | 22.3 | 23.0 | 18.1 | 19.2 | 19.9 | 20.7 | — | — | 88.5 | 90.7 | 11 | 15 | 9 | 19 |
| B.41211 ... | 52.88 | 37.54 | 33.76 | 33.86 | 20.5 | 20.6 | 20.3 | 21.3 | 18.1 | 16.0 | 17.2 | 18.7 | — | — | 84.9 | 87.5 | 8 | 15 | 6 | 25 |
| B.4466 ... | 44.88 | 34.46 | 30.89 | 33.99 | 20.2 | 20.9 | 19.6 | 22.1 | 17.1 | 17.1 | 17.4 | 19.5 | — | — | 87.2 | 91.3 | 6 | 9 | 10 | 13 |
| B.46103 ... | 39.10 | 31.03 | 26.03 | 25.57 | 20.9 | 21.4 | 20.8 | 22.3 | 18.1 | 18.2 | 18.2 | 19.6 | — | — | 86.8 | 90.6 | 14 | 9 | 8 | 19 |
| B.4738 ... | 41.33 | 48.17 | 41.76 | 46.66 | 21.1 | 21.4 | 21.0 | 22.9 | 18.1 | 18.5 | 18.3 | 20.3 | — | — | 87.4 | 91.4 | 7 | 8 | 6 | 9 |
| B.4743 ... | 39.96 | 38.74 | 33.30 | 35.51 | 20.9 | 21.3 | 21.4 | 21.7 | 16.9 | 18.0 | 17.4 | 17.9 | — | — | 83.5 | 83.5 | 8 | 5 | 8 | 15 |
| B.4744 ... | 53 87 | 41.97 | 31.61 | 33.02 | 22.1 | 22.5 | 21.3 | 22.6 | 18.8 | 17.7 | 18.7 | 20.1 | — | — | 86.6 | 90.5 | 6 | 16 | 12 | 31 |
| B.4747 ... | 44.56 | 46.93 | 39.14 | 44.86 | 20.5 | 21.7 | 20.9 | 22.1 | 17.3 | 18.0 | 18.5 | 19.2 | — | — | 86.0 | 88.8 | 24 | 17 | 9 | 20 |
| B.4764 ... | 41.09 | 40.13 | 34.30 | 40.16 | 21.9 | 21.1 | 22.0 | 22.7 | 18.7 | 18.6 | 19.2 | 19.8 | — | — | 87.4 | 88.3 | 6 | 11 | 11 | 14 |
| B.4781 ... | 42.80 | 39.35 | 37.11 | 39.52 | 20.4 | 22.4 | 20.9 | 22.7 | 18.0 | 18.8 | 18.5 | 20.6 | — | — | 87.8 | 91.1 | 6 | 7 | 4 | 9 |
| B.4788 ... | 39.71 | 37.38 | 36.83 | 36.75 | 21.4 | 22.2 | 21.9 | 22.7 | 17.8 | 19.2 | 18.7 | 19.3 | — | — | 86.3 | 87.1 | 6 | 11 | 7 | 15 |
| B.47135 ... | 42.40 | 36.99 | 32.52 | 33.41 | 19.5 | 21.3 | 20.0 | 22.0 | 15.1 | 18.5 | 17.7 | 19.6 | — | — | 87.4 | 91.7 | 7 | 6 | 4 | 10 |
| B.47147 ... | 43.51 | 31.73 | 28.02 | 28.96 | 20.7 | 21.0 | 20.5 | 21.8 | 17.3 | 17.1 | 17.5 | 19.3 | — | — | 86.2 | 90.6 | 7 | 14 | 4 | 11 |
| B.47151 ... | 41.55 | 32.42 | 32.40 | 35.47 | 20.7 | 21.8 | 22.3 | 22.4 | 17.8 | 18.0 | 18.2 | 18.6 | — | — | 84.5 | 87.7 | 26 | 9 | 10 | 12 |
| B.47162 ... | 41.12 | 37.11 | 34.49 | 40.02 | 21.2 | 22.6 | 21.6 | 22.7 | 17.4 | 18.8 | 17.9 | 19.9 | — | — | 85.0 | 89.3 | 11 | 14 | 8 | 19 |
| B.47214 ... | 41.19 | 32.47 | 22.45 | 22.11 | 20.2 | 20.7 | 20.6 | 21.7 | 16.4 | 16.9 | 17.4 | 20.1 | — | — | 87.9 | 91.8 | 10 | 11 | 15 | 20 |
| B.47216 ... | 43.57 | 33.57 | 28.11 | 29.17 | 20.2 | 20.9 | 21.3 | 22.7 | 16.5 | 17.4 | 17.2 | 19.8 | — | — | 87.4 | 91.2 | 9 | 9 | 8 | 19 |
| B.47217 ... | 39.79 | 30.22 | 24.67 | 23.41 | 19.5 | 20.9 | 20.0 | 22.7 | 15.8 | 18.7 | 16.7 | 19.6 | — | — | 86.7 | 91.7 | 12 | 10 | 17 | 13 |
| B.47258 ... | 43.50 | 36.17 | 33.20 | 36.73 | 21.9 | 22.8 | 22.0 | 23.0 | 19.9 | 19.5 | 20.0 | 21.8 | — | — | 88.4 | 92.8 | 6 | 10 | 6 | 11 |
| B.47314 ... | 44.90 | 39.18 | 28.54 | 33.32 | 21.0 | 22.3 | 20.1 | 22.9 | 18.7 | 18.8 | 17.7 | 21.2 | — | — | 87.3 | 91.9 | 3 | 7 | 7 | 5 |
| B.47379 ... | 37.73 | 29.26 | 28.11 | 33.76 | 20.3 | 21.2 | 20.8 | 22.5 | 15.8 | 17.6 | 17.4 | 18.9 | — | — | 88.3 | 87.4 | 7 | 9 | 10 | 19 |
| B.47380 ... | 43.38 | 34.56 | 29.26 | 26.32 | 23.2 | 23.8 | 23.2 | 23.9 | 19.3 | 20.1 | 19.8 | 21.0 | — | — | 87.4 | 91.3 | 9 | 13 | 12 | 17 |
| B.47397 ... | 41.19 | 30.44 | 27.23 | 28.96 | 20.6 | 21.2 | 21.0 | 22.2 | 17.6 | 16.7 | 17.4 | 19.4 | — | — | 83.2 | 88.5 | 19 | 11 | 11 | 17 |
| B.47419 ... | 51.32 | 36.54 | 35.98 | 36.32 | 20.5 | 21.5 | 21.1 | 22.8 | 18.6 | 18.2 | 19.0 | 20.2 | — | — | 88.2 | 90.3 | 16 | 37 | 8 | 15 |

*Purity figures were not obtained for the plant cane and first ratoon crops.

The following differences between mean yields may be considered significant:—

Plant Canes ± 5.31 tons cane per acre. First Ratoons ± 4.93 tons cane per acre.

Second Ratoons ± 5.48 tons cane per acre. Third Ratoons ± 5.80 tons cane per acre.

In the third ratoon trial at Wotton, B.4738 gave the heaviest yield of ratoon cane followed by B.4747, B.4764 and B.47162: all of these varieties were significantly better than B.37161. Taking the average yield over four crops, B.4738 has given the heaviest yield of cane, followed by B.4747, B.4744, B.47419 and B.41211. B.4738 has quite a good juice but tends to flower heavily as a plant cane, particularly at the higher elevations. It appears to give most of its yield in the ratoon crops. B.4747 is thin and grows in a tangled mass, which makes cutting and cleaning rather difficult. Its juice quality also is not as good as it might be. B.4744 and B.47419 are being grown commercially in Barbados.

TABLE XVII

*Soil Type:—Group II(b) Select Seedling Trials—Plant Canes*

*Friendship — Cut — 5th February, 1954*

*Hannays — Cut — 5th March, 1954*

| VARIETY | TONS CANE PER ACRE | | TONS SUGAR PER ACRE | | % SUCROSE IN CANE | | PURITY | | NO. OF ROTTEN CANES PER PLOT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Friendship | Hannays | Friendship | Hannays | Friendship | Hannays | Friendship | Hannays | Friendship | Hannays |
| B.37161 ... | 44.43 | 34.18 | 5.88 | 5.03 | 13.3 | 14.7 | 89.8 | 90.8 | 13 | 18 |
| B.46364 ... | 43.87 | 35.63 | 5.65 | 5.18 | 12.9 | 14.5 | 87.8 | 90.3 | 5 | 9 |
| B.4738 ... | 45.65 | 32.67 | 5.13 | 4.91 | 11.2 | 15.0 | 81.8 | 90.3 | 9 | 29 |
| B.4744 ... | 51.53 | 46.87 | 6.85 | 7.29 | 13.3 | 15.6 | 87.2 | 90.7 | 15 | 18 |
| B.47419 ... | 47.24 | 41.50 | 5.73 | 6.47 | 12.1 | 15.6 | 83.4 | 90.6 | 14 | 39 |

The following differences between mean yields may be considered significant:—

Friendship ± 3.72 tons cane and ± 0.59 tons sugar per acre.
Hannays ± 2.44 tons cane and ± 0.41 tons sugar per acre.

In both of these trials, B.4744 gave the heaviest yield of plant cane and sugar. It was significantly better than all others at Hannays, but just failed to be significant over B.47419 at Friendship. However, it significantly outyielded all varieties on sugar. At Friendship, B.47419 was significantly better than B.46364 on cane and B.4738 on sugar. At Hannays, B.47419 was significantly better than B.37161, B.46364 and B.4738 on cane and sugar. There was no significant difference between the last three mentioned varieties on cane or sugar. B.4744 and B.37161 gave the best juice at Friendship, and B.4744 and B.47419 were best at Hannays. The trial at Friendship was cut relatively early in the season and the canes were somewhat immature.

TABLE XVIII

*Soil Type:—Group II(b) Select Seedling Trials—First Ratoons*
*Searles — Cut — 12th February, 1954*

| VARIETY | TONS CANE PER ACRE | | TONS SUGAR PER ACRE | | % SUCROSE IN CANE | | PURITY | | NO. OF ROTTEN CANES PER PLOT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns |
| B.37161 ... | 34.18 | 30.34 | 4.79 | 4.82 | 14.0 | 15.9 | 89.6 | 91.7 | 11 | 7 |
| B.41211 ... | 41.68 | 43.29 | 5.70 | 6.33 | 13.7 | 14.7 | 87.0 | 88.3 | 5 | 10 |
| B.4744 ... ... | 44.30 | 40.98 | 6.20 | 6.31 | 14.1 | 15.4 | 89.1 | 90.0 | 8 | 9 |
| B.47419 ... | 41.94 | 43.50 | 5.68 | 6.42 | 13.5 | 14.8 | 86.7 | 89.5 | 14 | 12 |

The following differences between mean yields may be considered significant:—

Plant Canes ± 6.75 tons cane per acre and ± 0.74 tons sugar per acre.
First Ratoons ± 5.43 tons cane per acre and ± 0.84 tons sugar per acre.

In this trial, B.47419 gave the heaviest yield of cane and sugar, very closely followed by B.41211 and B.4744. All of these varieties significantly outyielded B.37161.

Taking the results over the two crops, B.47419 has given the heaviest yield of cane closely followed by B.4744 and B.41211, with B.37161 some twenty tons behind. B.4744 has given the heaviest yield of sugar, closely followed by B.47419 and B.41211. The juice qualities of B.41211 and B.47419 were poorer than those of the other two varieties tried. However, both of these varieties have relatively low fibre content, and give considerably more juice per ton of cane. In addition, B.41211 was cut rather too early for its juice to be at its best. When it is really ripe, the juice of B.41211 is slightly better than that of B.37161 cut at the same time.

## Table XIX

*Soil Type:—Group II(b) Select Seedling Trials—First Ratoons*

*Hampton — Cut — 2nd April, 1954*

| Variety | Tons Cane per Acre | | Tons Sugar per Acre | | % Sucrose in Cane | | Purity | | No. of Rotten Canes per Plot | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns |
| B.37161 ... | 30.46 | 30.78 | 4.28 | 5.01 | 14.0 | 16.3 | 88.3 | 92.7 | 37 | 17 |
| B.41211 ... | 27.60 | 35.97 | 4.01 | 5.58 | 14.5 | 15.5 | 85.7 | 86.3 | 57 | 15 |
| B.4744 ... | 29.08 | 29.41 | 4.32 | 4.93 | 14.8 | 16.8 | 87.1 | 90.6 | 39 | 18 |
| B.47419 ... | 24.24 | 27.13 | 3.79 | 4.84 | 15.7 | 17.9 | 88.3 | 91.1 | 63 | 18 |

The differences between the main yields of cane and sugar in the plant cane trial and of sugar in the first ratoons proved to be insignificant.

A difference of ± 5.77 tons cane per acre in the ratoon trial may be considered significant.

In the ratoon trial, B.41211 gave the heaviest yield of ratoon cane and proved to be significantly better than B.4744 and B.47419. The differences between mean yields of sugar are not significant. The yields from this trial were poor, and variation in yield from plot to plot was very great.

TABLE XX

*Soil Type:—Group II(c) Third Year Seedling Trials—Plant Canes*

*Wakefield — Cut — 18th and 19th March, 1954*

*Portland — Cut — 25th and 26th February, 1954*

| VARIETY | TONS CANE PER ACRE | | Z.H.R. BRIX | | % SUCROSE IN JUICE | | PURITY | | NO. OF ROTTEN CANES PER PLOT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wake-field | Port-land | Wake-field | Port-land | Wake-field | Port-land | Wake-field | Port-land | Wake-field | Port-land |
| B.37161 ... | 35.53 | 44.11 | 17.1 | 17.5 | 15.8 | 15.9 | 89.9 | 89.9 | 48 | 5 |
| B.4744 ... | 57.87 | 56.39 | 19.2 | 18.2 | 16.1 | 16.5 | 87.2 | 89.6 | 24 | 4 |
| B.49119 ... | 49.76 | 54.95 | 18.7 | 19.3 | 16.5 | 17.0 | 87.8 | 89.4 | 19 | 4 |
| B.5011 ... | 41.01 | 49.66 | 19.2 | 19.0 | 17.1 | 17.1 | 88.2 | 89.2 | 24 | 3 |
| B.5028 ... | 42.44 | 49.38 | 19.5 | 17.5 | 16.2 | 16.2 | 85.5 | 89.2 | 26 | 9 |
| B.5037 ... | 44.74 | 51.22 | 19.2 | 18.1 | 18.0 | 15.9 | 91.3 | 88.6 | 20 | 8 |
| B.5047 ... | 39.66 | 48.98 | 18.2 | 17.8 | 16.2 | 15.8 | 86.8 | 87.9 | 30 | 8 |
| B.5098 ... | 45.45 | 51.22 | 17.3 | 18.1 | 15.9 | 16.5 | 87.2 | 89.8 | 24 | 5 |
| B.50109 ... | 44.72 | 51.11 | 17.3 | 18.6 | 16.4 | 15.6 | 90.1 | 88.8 | 42 | 11 |
| B.50112 ... | 44.72 | 51.51 | 16.4 | 18.9 | 16.5 | 16.9 | 87.9 | 89.6 | 34 | 4 |
| B.50115 ... | 45.13 | 51.71 | 17.6 | 16.7 | 15.8 | 13.0 | 88.3 | 84.4 | 14 | 10 |
| B.50153 ... | 45.05 | 50.62 | 19.7 | 19.6 | 17.8 | 17.7 | 90.2 | 90.2 | 33 | 12 |
| B.50166 ... | 39.31 | 49.72 | 16.5 | 16.9 | 15.5 | 14.0 | 89.6 | 87.0 | 24 | 8 |
| B.50210 ... | 39.69 | 48.46 | 17.3 | 18.3 | 16.9 | 15.9 | 88.7 | 88.3 | 13 | 6 |
| B.50267 ... | 43.12 | 54.94 | 19.9 | 18.8 | 17.7 | 16.2 | 89.0 | 88.0 | 21 | 6 |
| B.50268 ... | 44.03 | 53.98 | 18.6 | 17.7 | 16.4 | 14.3 | 88.9 | 87.7 | 89 | 35 |
| B.50275 ... | 43.15 | 58.48 | 18.1 | 18.5 | 15.7 | 15.6 | 86.5 | 88.7 | 37 | 8 |
| B.50311 ... | 38.13 | 48.28 | 18.0 | 17.6 | 17.0 | 16.4 | 90.3 | 89.5 | 21 | 8 |
| B.50347 ... | 49.93 | 55.53 | 16.8 | 17.7 | 15.9 | 15.7 | 86.8 | 87.9 | 17 | 5 |
| B.50377 ... | 37.69 | 45.12 | 19.1 | 19.6 | 17.7 | 17.0 | 90.8 | 89.9 | 14 | 3 |

The following differences between mean yields may be considered significant:—

Wakefield ± 4.69 tons cane per acre.
Portland ± 4.66 tons cane per acre.

At Wakefield, B.4744 gave the heaviest yield of plant cane, significantly out-yielding all other varieties tried. It was followed by B.50347 and B.49119. B.37161 gave the lowest yield of any of the varieties tried. This field was badly infested with vines, recumbent varieties being nearly completely covered, and obviously suffering more than the erect varieties. B.5037 gave the best juice followed by B.50153, B.50267 and B.50377. The juice quality of B.49119 was satisfactory, while that of B.50347 was poor.

At Portland, B.50275 gave the heaviest yield of plant cane, followed by B.4744, B.50347, B.49119 and B.50267. Here again, the standard variety, B.37161, gave the poorest yield of any of the varieties tried.

B.50153 gave the best juice, followed by B.5011, B.50377 and B.49119.

TABLE XXI

*Soil Type:—Group II(c) Third Year Seedling Trials—First Ratoons*

*Portland — Cut — 1st and 2nd March, 1954*

| VARIETY | TONS CANE PER ACRE | | Z.H.R. BRIX | | % SUCROSE IN JUICE | | PURITY | | No. OF ROTTEN CANES PER PLOT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. |
| B.37161 ... | 48.72 | 43.39 | 19.6 | 18.3 | 17.4 | 16.1 | 89.4 | 88.3 | 10 | 6 |
| B·41211 ... | 50.91 | 53.99 | 18.6 | 18.7 | 16.2 | 16.7 | 84.7 | 89.8 | 18 | 9 |
| B.4744 ... | 61.84 | 55.60 | 20.0 | 19.0 | 18.1 | 17.0 | 88.9 | 90.1 | 12 | 7 |
| B.47419 ... | 49.01 | 46.59 | 18.5 | 18.8 | 16.2 | 16.5 | 85.2 | 90.1 | 16 | 9 |
| B.4906 ... | 46.89 | 44.98 | 23.0 | 20.4 | 19.3 | 17.8 | 87.8 | 90.6 | 10 | 7 |
| B.4942 ... | 50.29 | 41.09 | 21.3 | 19.7 | 19.2 | 17.9 | 88.6 | 90.2 | 12 | 6 |
| B.4956 ... | 53.42 | 46.05 | 18.2 | 17.9 | 14.3 | 15.9 | 84.1 | 89.1 | 17 | 11 |
| B.4966 ... | 48.20 | 46.41 | 20.0 | 18.7 | 17.0 | 17.0 | 85.8 | 89.0 | 12 | 9 |
| B.49122 ... | 46.17 | 34.83 | 20.0 | 18.5 | 15.9 | 16.2 | 87.1 | 90.5 | 16 | 12 |
| B.49186 ... | 43.66 | 38.36 | 19.5 | 19.0 | 17.2 | 16.6 | 87.2 | 90.2 | 8 | 6 |
| B.49198 ... | 54.06 | 49.38 | 19.3 | 18.0 | 14.6 | 14.3 | 79.7 | 87.9 | 6 | 5 |
| B.49229 ... | 42.36 | 39.58 | 20.4 | 19.5 | 19.6 | 17.4 | 90.4 | 89.8 | 21 | 8 |
| B.49257 ... | 67.35 | 59.01 | 18.0 | 17.5 | 14.8 | 13.8 | 82.9 | 84.7 | 20 | 14 |
| B.49301 ... | 39.73 | 38.02 | 19.8 | 18.4 | 17.4 | 16.6 | 87.0 | 89.3 | 13 | 6 |
| B·49309 ... | 39.60 | 34.17 | 19.8 | 18.9 | 17.4 | 17.8 | 88.5 | 92.1 | 18 | 10 |
| B.49311 ... | 52.32 | 49.67 | 20.5 | 18.8 | 19.0 | 15.8 | 90.0 | 87.6 | 16 | 5 |
| B.49346 ... | 44.13 | 40.78 | 18.4 | 17.5 | 14.5 | 14.6 | 78.3 | 83.5 | 13 | 10 |
| B.49353 ... | 44.18 | 36.36 | 20.7 | 19.6 | 17.1 | 17.4 | 88.5 | 91.9 | 14 | 5 |
| B.49355 ... | 48.13 | 42.02 | 19.8 | 19.2 | 17.4 | 16.9 | 87.5 | 90.5 | 16 | 6 |
| B.49376 ... | 52.48 | 42.36 | 19.1 | 18.0 | 17.3 | 15.4 | 87.8 | 88.0 | 14 | 9 |

The following differences between mean yields may be considered significant:—

Plant Canes ± 6.66 tons cane per acre.
First Ratoons ± 6.43 tons cane per acre.

In the ratoon trial, B.49257 gave the heaviest yield of ratoon cane followed by B.4744 and B.41211. B.49311 also gave a good yield, but its juice quality, which is normally very good, was among the poorest on this occasion. B.49257 has a very poor juice and appears to be susceptible to red rot. It cannot therefore be recommended for planting on a commercial scale. B.41211 was not fully ripe when this trial was cut, and its juice was not as good as it might have been. B.4744 appears to be a useful variety for the high rainfall areas, and has quite a good juice considering its heavy cane yields.

## Table XXII

*Soil Type:—Group II(c) Third Year Seedling Trials—Third Ratoons*
*Easy Hall — Cut — 29th and 30th April, 1954*

| Variety | Tons Cane per Acre | | | | Z.H.R. Brix | | | | % Sucrose in Juice | | | | Purity | | | | No. of Rotten Canes per Plot | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. | Plant Canes | 1st Rtns. | 2nd Rtns. | 3rd Rtns. |
| B.37161 ... | 45.60 | 38.24 | 34.22 | 24.29 | 18.3 | 21.8 | 21.1 | 20.9 | 15.4 | 18.4 | 19.6 | 17.7 | * | * | 92.9 | 91.6 | 11 | 18 | 15 | 10 |
| B.4098 ... | 47.78 | 39.57 | 37.99 | 37.91 | 19.0 | 21.2 | 21.8 | 21.3 | 16.2 | 18.2 | 19.8 | 19.6 | — | — | 91.3 | 92.2 | 8 | 26 | 16 | 16 |
| B.41211 ... | 56.73 | 39.49 | 34.53 | 26.49 | 18.8 | 21.2 | 21.9 | 20.1 | 13.7 | 19.6 | 18.9 | 16.7 | — | — | 87.6 | 87.8 | 23 | 83 | 27 | 15 |
| B.4466 ... | 49.15 | 42.82 | 33.89 | 25.91 | 19.0 | 21.2 | 21.4 | 19.6 | 15.7 | 19.2 | 18.7 | 17.1 | — | — | 91.0 | 91.8 | 8 | 15 | 15 | 10 |
| B.46103 ... | 43.94 | 35.90 | 29.86 | 22.64 | 19.3 | 21.6 | 22.7 | 21.7 | 16.6 | 18.3 | 20.4 | 18.8 | — | — | 92.5 | 91.4 | 10 | 37 | 17 | 7 |
| B.4738 ... | 47.29 | 46.02 | 41.49 | 39.60 | 18.5 | 21.1 | 20.9 | 20.0 | 16.2 | 18.1 | 19.2 | 17.2 | — | — | 90.2 | 89.6 | 9 | 23 | 18 | 16 |
| B.4743 ... | 49.14 | 43.56 | 40.97 | 37.88 | 18.4 | 20.0 | 20.8 | 20.3 | 15.1 | 17.3 | 17.9 | 17.1 | — | — | 88.3 | 87.2 | 7 | 22 | 15 | 9 |
| B.4744 ... | 76.05 | 53.11 | 42.44 | 39.87 | 19.5 | 21.3 | 21.5 | 21.1 | 16.5 | 17.7 | 19.3 | 18.6 | — | — | 90.7 | 92.4 | 12 | 28 | 25 | 11 |
| B.4747 ... | 51.03 | 45.01 | 34.57 | 26.22 | 18.6 | 20.2 | 21.5 | 20.8 | 15.9 | 18.1 | 18.7 | 18.3 | — | — | 89.5 | 88.4 | 14 | 44 | 25 | 11 |
| B.4781 ... | 53.64 | 41.32 | 38.57 | 34.12 | 18.5 | 21.9 | 21.4 | 20.0 | 15.7 | 19.3 | 18.5 | 17.8 | — | — | 89.6 | 91.5 | 11 | 22 | 23 | 17 |
| B.4788 ... | 45.63 | 37.85 | 35.89 | 36.35 | 18.3 | 20.9 | 22.3 | 21.7 | 16.2 | 18.3 | 19.9 | 19.4 | — | — | 91.4 | 93.2 | 11 | 38 | 13 | 11 |
| B.47135 ... | 58.30 | 43.78 | 40.61 | 32.35 | 17.4 | 20.7 | 21.0 | 19.7 | 12.9 | 18.4 | 19.1 | 17.5 | — | — | 91.0 | 91.5 | 8 | 50 | 22 | 10 |
| B.47151 ... | 52.74 | 46.25 | 39.67 | 38.67 | 18.9 | 20.7 | 21.0 | 21.9 | 15.7 | 17.1 | 18.4 | 18.8 | — | — | 88.8 | 89.6 | 23 | 16 | 21 | 16 |
| B.47162 ... | 52.03 | 44.39 | 38.58 | 34.38 | 18.0 | 21.7 | 21.9 | 20.8 | 15.4 | 19.5 | 19.7 | 18.7 | — | — | 91.3 | 92.1 | 9 | 24 | 19 | 9 |
| B.47204 ... | 53.42 | 44.87 | 41.24 | 39.34 | 18.0 | 18.3 | 20.9 | 21.3 | 14.9 | 16.7 | 18.6 | 19.3 | — | — | 87.1 | 90.7 | 20 | 27 | 20 | 10 |
| B.47214 ... | 45.01 | 28.65 | 25.41 | 21.85 | 17.7 | 20.2 | 20.7 | 20.3 | 13.7 | 17.0 | 18.9 | 17.6 | — | — | 91.1 | 92.8 | 18 | 47 | 31 | 18 |
| B.47216 ... | 53.67 | 36.55 | 28.38 | 24.28 | 17.2 | 20.1 | 21.2 | 19.7 | 12.5 | 16.6 | 18.4 | 17.0 | — | — | 91.8 | 91.4 | 12 | 32 | 12 | 11 |
| B.47217 ... | 52.40 | 32.00 | 27.58 | 23.16 | 17.5 | 20.4 | 20.5 | 20.1 | 14.1 | 16.3 | 18.8 | 17.9 | — | — | 90.5 | 93.2 | 18 | 44 | 23 | 21 |
| B.47233 ... | 48.03 | 32.72 | 29.79 | 26.48 | 19.0 | 20.5 | 21.3 | 19.7 | 15.1 | 18.2 | 19.3 | 17.6 | — | — | 91.2 | 92.7 | 15 | 43 | 26 | 16 |
| B.47258 ... | 53.07 | 43.77 | 41.85 | 36.73 | 19.2 | 22.4 | 23.1 | 21.1 | 16.6 | 20.0 | 21.2 | 18.9 | — | — | 91.4 | 91.8 | 9 | 17 | 14 | 7 |
| B.47314 ... | 50.38 | 50.82 | 40.81 | 39.02 | 19.1 | 21.8 | 21.9 | 22.5 | 17.1 | 18.6 | 19.5 | 20.2 | — | — | 90.0 | 93.5 | 7 | 9 | 18 | 3 |
| B.47379 ... | 59.35 | 39.18 | 34.21 | 31.55 | 19.0 | 20.9 | 21.3 | 20.1 | 15.8 | 18.0 | 18.8 | 18.2 | — | — | 90.1 | 93.0 | 8 | 20 | 14 | 14 |
| B.47380 ... | 49.51 | 33.36 | 30.59 | 26.11 | 20.1 | 23.1 | 22.5 | 22.0 | 17.6 | 19.9 | 20.8 | 19.3 | — | — | 92.5 | 90.0 | 7 | 52 | 16 | 14 |
| B.47397 ... | 51.88 | 36.97 | 31.24 | 26.75 | 18.8 | 19.4 | 20.9 | 20.8 | 15.3 | 15.6 | 17.3 | 16.3 | — | — | 82.2 | 84.7 | 15 | 36 | 15 | 8 |
| B.47419 ... | 65.39 | 46.12 | 36.89 | 32.67 | 18.7 | 21.7 | 22.4 | 21.6 | 16.4 | 19.1 | 19.6 | 19.7 | — | — | 91.8 | 92.2 | 16 | 35 | 25 | 14 |

**Purity figures were not obtained for the plant cane and first ratoon crops.*

The first ratoon crop was heavily infested with rats, which caused a considerable reduction of the yields. The second ratoon crop was burnt before the canes were cut, and the third ratoon crop was heavily infested with the cane root mealy bug which caused a considerable reduction in the yields.

The following differences between mean yields may be considered significant:—

| | |
|---|---|
| Plant Canes | ± 5.48 tons cane per acre. |
| First Ratoons | ± 6.03 tons cane per acre. |
| Second Ratoons | ± 4.19 tons cane per acre. |
| Third Ratoons | ± 4.68 tons cane per acre. |

In this trial, B.4744 gave the heaviest yield of third ratoon cane, closely followed by B.4738, B.47204 and B.47314. B.47314 gave the best quality juice as judged by the percentage of sucrose, and also had the highest purity. B.47419, B.4788, B.4098, B.47204 and B.47380 also gave juices of very good sugar content.

Taking the yields from the four crops, B.4744 has given the heaviest yield of cane by a wide margin, having averaged over 17 tons cane per acre more than the standard variety, B.37161. In addition, the juice quality appears to be somewhat better than that of B.37161. B.47314 and B.47419 have given the second heaviest yield of cane. The former has a very good juice. However, it is very high in fibre and is very difficult to cut. The latter has a good juice and has been recommended for trial on a commercial scale.

## TABLE XXIII

*Soil Type:—Group II(c) Select Seedling Trials—Plant Canes*

*Drax Hall — Cut — 18th March, 1954*

*Mount Brevitor — Cut — 23rd March, 1954*

| Variety | Tons Cane per Acre | | Tons Sugar per Acre | | % Sucrose in Cane | | Purity | | No. of Rotten Canes per Plot | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Drax Hall | Mount Brevitor | Drax Hall | Mount Brevitor | Drax Hall | Mount Brevitor | Drax Hall | Mount Brevitor | Drax Hall | Mount Brevitor |
| B.37161 | 36.89 | 46.87 | 4.93 | 6.36 | 13.4 | 13.6 | 90.0 | 88.8 | 28 | 38 |
| B.46364 | — | 48.22 | — | 6.55 | — | 13.6 | — | 88.0 | — | 33 |
| B.4744 | 53.49 | 55.61 | 8.03 | 7.66 | 15.0 | 13.8 | 89.8 | 86.0 | 39 | 38 |
| B.47380 | 35.94 | 45.92 | 5.35 | 6.64 | 14.8 | 14.4 | 90.2 | 87.1 | 56 | 63 |
| B.47419 | 44.97 | 55.40 | 6.60 | 7.78 | 14.6 | 14.0 | 88.3 | 86.6 | 40 | 62 |
| B.49119 | 39.41 | — | 5.40 | — | 13.7 | — | 88.6 | — | 15 | — |

The following differences between mean yields may be considered significant:—

Drax Hall ± 5.03 tons cane per acre.
± 0.94 tons sugar per acre.

Mount Brevitor ± 4.40 tons cane per acre.
± 0.63 tons sugar per acre.

The plots in both trials suffered some damage from rats.

At Drax Hall, B.4744 gave the heaviest yield of cane and sugar and significantly outyielded all other varieties tried. B.47419 outyielded B.49119, B.37161 and B.47380 significantly on cane and sugar. B.49119 gave the next heaviest yield of cane and sugar, but cannot be shown to be significantly better than B.47380 and B.37161.

At Mount Brevitor, B.4744 gave the heaviest yield of cane closely followed by B.47419. The latter, however, gave the heaviest yield of sugar. Both of these varieties significantly outyielded the other varieties tried. The differences between the mean yields of cane and sugar of the varieties B.37161, B.46364 and B.47380 cannot be shown to be significant. B.47380 gave the best juice quality, followed by B.47419. There was little to choose between the juice qualities of B.37161, B.46364 and B.4744.

## Table XXIV

*Soil Type:—Group II(c) Select Seedling Trials—First Ratoons*

*Applewhaites — Cut — 8th April, 1954*

| Variety | Tons Cane per Acre | | Tons Sugar per Acre | | % Sucrose in Cane | | Purity | | No. of Rotten Canes per Plot | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns |
| B.37161 ... | 44.08 | 43.18 | 6.04 | 5.97 | 13.7 | 13.8 | 89.5 | 90.2 | 24 | 27 |
| B.41211 ... | 45.44 | 50.89 | 6.69 | 7.11 | 14.7 | 13.9 | 88.4 | 88.5 | 55 | 54 |
| B.45151 ... | 48.61 | 50.42 | 7.33 | 7.71 | 15.1 | 15.3 | 90.0 | 90.7 | 20 | 32 |
| B.4744 ... ... | 51.88 | 52.95 | 7.69 | 7.69 | 14.8 | 14.5 | 88.9 | 89.7 | 26 | 46 |
| B.47419 ... | 49.90 | 51.73 | 7.31 | 7.74 | 14.6 | 15.0 | 88.6 | 89.2 | 28 | 25 |

The following differences between mean yields may be considered significant:—

Plant Canes ± 3.39 tons cane and ± 0.64 tons sugar per acre.
First Ratoons ± 2.92 tons cane and ±0.56 tons sugar per acre.

In this trial, B.4744 gave the heaviest yield of cane followed by B.47419, B.41211 and B.45151. All of these varieties significantly outyielded B.37161 on cane. B.47419 gave the heaviest yield of sugar very closely followed by B.45151 and B.4744. All of these varieties significantly outyielded B.41211 and B.37161 on sugar. B.41211 in turn significantly outyielded B.37161 on sugar.

Taking the results of the two trials, B.4744 has given the heaviest yield of cane and sugar closely followed by B.47419 and B.45151. B.45151 gave the best juice quality in both trials and had the highest purity. B.4744 gave the second best juice in the plant cane trial and B.47419 in the ratoon trial. There was some rat damage in both trials.

## Table XXV

*Soil Type:—Group II(c) Select Seedling Trials—First Ratoons*

*Bowmanston — Cut — 13th April 1954*

| Variety | Tons Cane per Acre | | Tons Sugar per Acre | | % Sucrose in Cane | | Purity | | No. of Rotten Canes per Plot | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. |
| B.37161 ... | 42.49 | 45.91 | 6.71 | 6.72 | 15.8 | 14.6 | 90.5 | 91.8 | 37 | 29 |
| B.41211 ... | 41.59 | 47.30 | 6.33 | 6.51 | 15.3 | 13.8 | 84.2 | 87.0 | 55 | 39 |
| B.45151 ... | 44.21 | 48.46 | 7.77 | 7.52 | 17.6 | 15.5 | 91.9 | 91.5 | 40 | 27 |
| B.4744 ... ... | 49.63 | 49.25 | 7.91 | 7.17 | 15.9 | 14.6 | 88.1 | 90.7 | 53 | 37 |
| B.47419 ... | 42.42 | 43.96 | 7.18 | 6.62 | 16.9 | 15.1 | 91.1 | 90.0 | 51 | 34 |

The following differences between mean yields may be considered significant:—

Plant Canes insignificant on cane and ± 1.02 tons sugar per acre.
First Ratoons ± 2.39 tons cane per acre and insignificant on sugar.

In this trial, B.4744 gave the heaviest yield of ratoon cane closely followed by B.45151 and B.41211. B.4744 and B.45151 significantly outyielded B.37161 and B.47419, while B.41211 significantly outyielded B.47419. B.45151 gave the heaviest yield of ratoon sugar followed by B.4744, B.37161, B.47419 and B.41211. However, the difference between the mean yields of sugar cannot be shown to be significant.

Taking the yields over the two crops, B.4744 has given the heaviest yield of cane followed by B.45151, B.41211 and B.37161. B.45151 has given the heaviest yield of sugar, followed by B.4744, B.47419 and B.37161.

B.45151 gave the best juice quality, followed by B.47419. There was a small amount of rat damage in both crops, and this is reflected in the number of rotten canes collected.

TABLE XXVI

*Soil Type:—Group IV(b) Third Year Seedling Trials—Plant Canes*

*Carrington — Cut — 3rd and 4th March, 1954*

| VARIETY | Tons Cane per Acre | Z.H.R. Brix | % Sucrose in Juice | Purity | No. of Rotten Canes per Plot |
|---|---|---|---|---|---|
| B.37161 ... ... | 39.25 | 20.7 | 19.2 | 90.9 | 15 |
| B.4744 ... ... | 45.09 | 20.8 | 18.2 | 87.7 | 18 |
| B.49119 ... ... | 42.51 | 20.8 | 18.8 | 88.6 | 10 |
| B.5011 ... ... | 36.15 | 22.2 | 19.1 | 86.5 | 18 |
| B.5028 ... ... | 40.85 | 21.0 | 19.1 | 88.4 | 12 |
| B.5037 ... ... | 37.30 | 22.1 | 19.4 | 90.3 | 13 |
| B.5047 ... ... | 35.98 | 20.4 | 18.6 | 88.1 | 13 |
| B.5098 ... ... | 42.34 | 20.0 | 17.1 | 85.2 | 9 |
| B.50109 ... ... | 36.36 | 20.9 | 19.5 | 89.9 | 46 |
| B.50112 ... ... | 43.68 | 20.3 | 19.4 | 89.2 | 13 |
| B.50115 ... ... | 40.58 | 17.8 | 14.6 | 82.7 | 14 |
| B.50153 ... ... | 38.26 | 21.1 | 19.6 | 91.2 | 15 |
| B.50166 ... ... | 37.56 | 19.8 | 18.0 | 89.8 | 11 |
| B.50210 ... ... | 39.94 | 21.4 | 18.1 | 87.4 | 9 |
| B.50267 ... ... | 41.12 | 21.3 | 18.7 | 89.1 | 19 |
| B.50268 ... ... | 35.82 | 19.9 | 17.3 | 87.1 | 48 |
| B.50275 ... ... | 39.73 | 20.8 | 18.0 | 89.0 | 16 |
| B.50311 ... ... | 40.40 | 21.1 | 18.7 | 88.8 | 9 |
| B.50347 ... ... | 40.26 | 20.1 | 16.9 | 87.4 | 11 |
| B.50377 ... ... | 34.26 | 22.4 | 20.7 | 90.0 | 10 |

A difference of $\pm$ 2.68 tons cane per acre may be considered significant.

In this trial, B.4744 gave the heaviest yield of plant cane followed by B.50112, B.49119 and B.5098. All of these varieties significantly outyielded the old standard, B.37161.

The juices of B.49119 and B.50112 were satisfactory, but that of B.5098 was poor in sucrose. As usual, the juice of B.50377 was outstanding, but its cane yield was the lowest of any of the varieties tried.

## Table XXVII

*Soil Type:—Group IV(b) Third Year Seedling Trials—First Ratoons*
*Carrington — Cut — 5th and 6th April, 1954*

| Variety | Tons Cane per Acre | | Z.H.R. Brix | | % Sucrose in Juice | | Purity | | No. of Rotten Canes per Plot | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. |
| B.37161... ... | 42.51 | 45.27 | 21.1 | 21.9 | 18.9 | 20.0 | 89.6 | 91.4 | 9 | 12 |
| B.41211... ... | 37.28 | 43.58 | 20.8 | 21.8 | 18.6 | 16.5 | 88.0 | 79.7 | 64 | 25 |
| B.4744 ... ... | 51.27 | 50.99 | 21.9 | 22.3 | 19.9 | 18.8 | 89.1 | 88.3 | 17 | 23 |
| B.47419... ... | 33.59 | 45.88 | 21.1 | 22.4 | 19.0 | 20.2 | 88.2 | 90.0 | 93 | 24 |
| B.4906 ... ... | 34.60 | 40.15 | 23.5 | 24.7 | 21.2 | 20.1 | 88.2 | 83.8 | 7 | 12 |
| B.4942 ... ... | 39.48 | 41.36 | 22.7 | 23.0 | 19.9 | 20.3 | 88.4 | 89.9 | 14 | 21 |
| B.4956 ... ... | 42.28 | 37.24 | 19.9 | 20.5 | 17.1 | 17.0 | 86.5 | 86.2 | 22 | 27 |
| B.4966 ... ... | 43.85 | 43.93 | 21.6 | 22.3 | 19.0 | 18.4 | 87.0 | 84.4 | 16 | 19 |
| B.49122... ... | 34.58 | 38.86 | 20.0 | 20.5 | 18.3 | 17.7 | 88.0 | 89.4 | 20 | 30 |
| B.49186... ... | 36.63 | 42.09 | 20.6 | 23.1 | 18.5 | 20.1 | 87.3 | 88.9 | 23 | 31 |
| B.49198... ... | 43.61 | 46.20 | 20.1 | 20.9 | 17.5 | 14.7 | 83.5 | 73.1 | 11 | 13 |
| B.49229... ... | 33.48 | 32.30 | 21.8 | 22.6 | 20.3 | 21.0 | 88.6 | 92.2 | 13 | 19 |
| B.49257... ... | 50.99 | 38.11 | 18.7 | 19.6 | 16.5 | 15.2 | 85.6 | 82.0 | 29 | 41 |
| B.49301... ... | 38.77 | 41.68 | 21.4 | 22.5 | 18.9 | 18.2 | 87.3 | 84.0 | 18 | 15 |
| B.49309... ... | 37.32 | 38.71 | 21.3 | 22.0 | 20.4 | 20.2 | 90.3 | 91.0 | 17 | 36 |
| B.49311... ... | 39.29 | 46.59 | 21.6 | 22.6 | 20.2 | 20.6 | 86.8 | 90.2 | 13 | 23 |
| B.49346... ... | 31.62 | 41.01 | 19.5 | 20.8 | 16.3 | 15.3 | 80.1 | 73.6 | 64 | 33 |
| B.49353... ... | 40.15 | 41.67 | 21.3 | 22.8 | 18.7 | 18.9 | 88.4 | 89.5 | 16 | 17 |
| B.49355... ... | 33.61 | 35.65 | 21.6 | 22.3 | 18.6 | 18.7 | 87.1 | 86.9 | 12 | 17 |
| B.49376... ... | 35.28 | 38.28 | 19.2 | 20.7 | 17.9 | 18.6 | 87.1 | 88.1 | 92 | 23 |

The following differences between mean yields may be considered significant:—

Plant Canes ± 6.62 tons cane per acre.
First Ratoons ± 6.71 tons cane per acre.

In this trial, B.4744 gave the heaviest yield of ratoon cane followed by B.49311, B.49198, B.47419 and B.37161. The juice quality of B.49311 was excellent while that of B.49198 was very poor. With a variety like B.4744 performing so well under these conditions, it is obvious that none of the varieties of the B.49′ series included in these trials is worthy of any further consideration.

## Table XXVIII

*Soil Type:—Group IV(b) Select Seedling Trials—Plant Canes*
*Bulkeley — Cut — 17th March, 1954*

| Variety | Tons Cane per Acre | Tons Sugar per Acre | % Sucrose in Cane | Purity | No. of Rotten Canes per Plot |
|---|---|---|---|---|---|
| B.37161 ... ... | 48.12 | 6.98 | 14.5 | 90.7 | 66 |
| B.4738 ... ... | 47.11 | 6.79 | 14.4 | 87.5 | 60 |
| B.4744 ... ... | 55.01 | 8.70 | 15.8 | 89.5 | 67 |
| B.47380 ... ... | 41.92 | 7.03 | 16.8 | 91.8 | 51 |
| B.47419 ... ... | 43.84 | 6.69 | 15.3 | 88.9 | 44 |

The following differences between mean yields may be considered significant:—

± 5.32 tons cane per acre and ± 0.82 tons sugar per acre.

In this trial, B.4744 gave the heaviest yield of cane and sugar, and significantly outyielded all other varieties tried. B.37161 gave the second heaviest yield of cane, closely followed by B.4738; both of these varieties significantly outyielded B.47380, but failed to be significantly better than B.47419.

B.47380 gave the second heaviest yield of sugar, closely followed by B.37161, B.4738 and B.47419. However, the differences between the mean sugar yields of these varieties cannot be shown to be significant. B.47380 gave an excellent juice of very high purity.

All of the varieties suffered rat damage, and this is reflected in the number of rotten canes found.

TABLE XXIX

*Soil Type:—Group IV(b) Select Seedling Trials—First Ratoons*

*Bulkeley — Cut — 14th April, 1954*

| VARIETY | TONS CANE PER ACRE | | TONS SUGAR PER ACRE | | % SUCROSE IN CANE | | PURITY | | NO. OF ROTTEN CANES PER PLOT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. | Plant Canes | 1st Rtns. |
| B.37161... ... | 40.09 | 38.92 | 5.62 | 6.33 | 14.0 | 16.3 | 87.9 | 92.3 | 15 | 34 |
| B.41211... ... | 30.65 | 42.16 | 4.17 | 6.62 | 13.7 | 15.7 | 84.6 | 88.9 | 223 | 47 |
| B.45151... ... | 34.99 | 40.67 | 5.54 | 6.97 | 15.8 | 17.1 | 87.9 | 91.8 | 107 | 40 |
| B.4744 ... ... | 46.97 | 41.88 | 6.88 | 7.03 | 14.7 | 16.7 | 85.9 | 91.4 | 30 | 33 |
| B.47419... ... | 38.90 | 39.17 | 5.86 | 6.72 | 15.1 | 17.2 | 86.0 | 91.6 | 75 | 30 |

The following differences between mean yields may be considered significant:—

Plant Canes ± 3.94 tons cane and ± 0.45 tons sugar per acre.
First Ratoons Insignificant on cane and sugar.

In this trial, B.41211 gave the heaviest yield of ratoon cane followed by B.4744, B.45151, B.47419 and B.37161. B.4744 gave the heaviest yield of ratoon sugar followed by B.45151, B.47419, B.41211 and B.37161. The differences between the mean yields of cane and sugar cannot be shown to be significant.

Taking the yields over the two crops, B.4744 has given the heaviest yield of cane and sugar. B.37161 has given the second heaviest yield of cane followed by B.47419, B.45151 and B.41211. However, it should be remembered that the plant cane crop suffered heavy rat damage, the varieties B.41211, B.45151 and B.47419 being the worst affected. Rat damage to the ratoon crop was much less, and more evenly spread between the varieties. B.47419 has given the second heaviest yield of sugar, closely followed by B.45151. Purities of all varieties with the exception of B.41211 in the plant cane crop were satisfactory.

## GENERAL

In the Third Year Seedling Trials, B.4744 and B.49119 appear to be outstanding. The former has done well in all rainfall categories and on all soil groups, but it would appear to be at its best in areas of intermediate and high rainfall. It is definitely not suited to the sandy soils of St. James and St. Peter where commercial ratoons were seen dying out during a dry spell. This variety appears to be unsuitable in the lower rainfall areas as it is unlikely that it would stand up to a very dry season.

B.49119 appears to stand the dry weather well, but tends to flower heavily at the higher elevations. It would therefore appear to be best suited to the low and intermediate rainfall areas, where flowering is not generally a limiting factor. The ratoon results of these trials are awaited with interest.

In the Third Year Seedling First Ratoon Trials, none of the seedlings of the B.49′ series was promising enough to warrant further trial under Barbados conditions.

In the Select Seedling Plant Cane Trials, B.4744 was outstanding. It has outyielded the old standard variety, B.37161, on cane and sugar in each trial. B.47419 has also done fairly well, and has a very good juice when it is ripe. B.4738 and B.46364 have done fairly well but have been somewhat disappointing.

In the Select Seedling Ratoon Trials, B.4744, B.47419 and B.45151 have all done well. B.45151 has an excellent juice, which usually makes up for any deficiency in cane tonnage. The juice quality of B.47419 is not so outstanding, but on account of its lower fibre content, sucrose in cane is usually high.

Dr. Steindl of Australia visited Barbados in August 1953, and found symptoms on various varieties which were similar to those usually associated with the ratoon stunting disease in Australia. Planting material of the various varieties was accordingly treated with hot water at 50°C. for two hours, and this has been planted at Codrington, Groves and The Pine to supply clean planting material to planters in November—December, 1954. The treatment severely affected germination, some varieties being more susceptible than others. B.41227 appears to be particularly susceptible. However, a few stools of this variety survived and these can be multiplied up to supply the necessary planting material.

## II. DESPATCH OF SEEDLINGS AND FUZZ TO CONTRIBUTING COLONIES

Cuttings of the varieties of the B.51′ series were sent to the various contributing colonies in October 1953. Fuzz of various crosses was also sent to Jamaica and British Guiana. The varieties and colonies to which they were sent together with a list of the crosses of which fuzz was sent are given below:—

| | |
|---|---|
| British Guiana & Trinidad ... | B.5121, B.5124, B.5143, B.5178, B.5192, B.51105, B.51116, B.51129, B.51131, B.51134, B.51156, B.51167, B.51168, B.51183, B.51190, B.51192, B.51211, B.51259, B.51311, B.51321, B.51353 and B.51355. |
| Jamaica ... ... ... ... | B.5121, B.5124, B.5126, B.5142, B.5143, B.5149, B.5178, B.5179, B.51116, B.51122, B.51129, B.51131, B.51134, B.51156, B.51190, B.51192, B.51259, B.51353, B.51355, B.51360, B.51367 and B.51374. |

In addition to the above, one cutting of each of the four hundred and four (404) seedlings of the B.53′ series was sent to Jamaica.

| | |
|---|---|
| Antigua and St. Kitts ... ... | B.5121, B.5124, B.5143, B.51116, B.51129, B.51131, B.51156, B.51167, B.51168, B.51183, B.51190, B.51192, B.51211, B.51259, B.51311, B.51321, B.51353, B.51355. |

In addition to the above, B.5178 was sent to Antigua.

| | |
|---|---|
| British Honduras ... ... | B.3439. |
| Dominica ... ... ... ... | Uba and B.45151. |
| St. Lucia ... ... ... ... | B.5032, B.5037, B.5041, B.5047, B.5093, B.50112, B.50135, B.50166, B.50267, B.50311, B.50347, B.50352, B.50370, B.50377, B.50378, B.5121, B.5124, B.5143, B.5149, B.5178, B.5179, B.51105, B.51116, B.51148, B.51156 and B.51183. |

In addition, the following varieties were sent to foreign countries:—

| | |
|---|---|
| United States of America ... | B.603, B.35206, B.40123, B.40175, B.4145, B.41203, B.42304, B.4373, B.43283 and B.47179. |
| Australia ... ... ... ... | B.4744, B.47419 and B.45151. |
| Martinique ... ... ... ... | B.5121, B.5124, B.5143, B.51116, B.51129, B.51131, B.51156, B.51167, B.51168, B.51190, B.51192, B.51211, B.51259, B.51311, B.51321, B.51353 and B.51355. |
| Guadeloupe ... .. ... | B.47314, B.4888, B.48259, B.48382, B.48392, B.49198, B.5093, B.5124, B.5143, B.51105, B.51116, B.51131, B.51148, B.51156, B.51183, B.46136, B.4738, B.48251, B.50126, B.50135 and B.50166. |
| Belgian Congo ... ... ... | B.34104, B.37161, B.37172, B.4098, B.41211 and B.41227. |
| Venezuela ... ... ... ... | B.4788, B.47179, B.47147, B.5124, B.5143, B.51105, B.51116, B.51148, B.51156 and B.51183. |
| Argentina ... ... ... ... | B.38192, B.4098, B.41227 and B.4362. |

## CANE FUZZ

**Jamaica**

| | | | |
|---|---|---|---|
| B.35207 | x P.O.J.2878 | B.3353 | x B.47419 |
| B.45220 | x B.47419 | B.3365 | x B.47419 |
| B.4502 | x B.47419 | B.47183 | x B.46136 |
| S.45 | x B.41227 | B.34102 | x B.47419 |
| B.49353 | x B.34104 | B.4502 | x P.O.J.2878 |
| B.39254 | x B.4744 | B.4362 | x B.4098 |
| B.4145 | x P.O.J.2878 | B.42279 | x B.47419 |
| P.O.J.2878 | x B.34104 | B.38212 | x P.O.J.2878 |

**Jamaica** (*Cont'd.*)

| | | | |
|---|---|---|---|
| B.42304 | x B.47419 | B.35206 | x B.4098 |
| B.42304 | x B.4098 | Co.421 | x B.4381 |
| B.45104 | x P.O.J.2878 | B.35247 | x B.42231 |
| B.4502 | x B.47419 | B.37161 | x P.O.J.2878 |
| B.4362 | x B.41227 | B.39254 | x B.47306 |
| B.45121 | x P.O.J.2878 | B.44305 | x B.4098 |
| B.44111 | x B.4098 | B.45170 | xP.O.J.2878 |

**British Guiana**

| | | | |
|---|---|---|---|
| B.3353 | x B.47419 | B.3365 | x Co.421 |
| B.3365 | x B.47419 | B.47183 | x B.46136 |
| S.45 | x B.41227 | B.37161 | x B.4098 |
| B.34102 | x B.47419 | B.37161 | x B.43337 |
| B.4502 | x P.O.J.2878 | B.39254 | x B.4744 |
| P.O.J.2878 | x B.34104 | B.4362 | x B.4098 |
| B.4145 | x P.O.J.2878 | B.45104 | x P.O.J.2878 |
| B.38212 | x P.O.J.2878 | B.4881 | x B.4098 |
| B.42304 | x B.47419 | B.35206 | x B.4098 |
| B.42304 | x B.4098 | B.4502 | x B.47419 |
| B.35247 | x B.42231 | B.37161 | x B.48259 |
| B.39254 | x B.47306 | B.37161 | x P.O.J.2878 |
| B.4362 | x B.41227 | B.37161 | x B.4905 |
| B.46103 | x B.4744 | B.37161 | x B.43337 |
| B.3439 | x B.3337 | B.44305 | xB.4098 |
| B.45151 | x P.O.J.2878 | B.45170 | x P.O.J.2878 |
| B.44111 | x B.4098 | | |

## SPECIAL INVESTIGATIONS

The standard Barbados-type breeding lantern has been in use with very little modification for more than twenty-five years. It has given very satisfactory results, but due to the rise in costs of materials and labour in recent years, is now expensive to construct, to maintain in a serviceable condition, to transport and to erect in the field. Accordingly, investigations were begun to devise an alternative type of lantern which would be more economical to build and use, but would be equally efficient. In association with the modified lanterns, some changes in the breeding technique would be necessary, so at the same time experiments were begun to evolve a method of maintaining cut arrows in preservative solution long enough to mature and shed normal pollen.

### 1. New Type of Breeding Lanterns

Two lanterns of a new type were constructed, using light circular wooden hoops at top and bottom, held in place by light vertical wooden laths. The tops were conical, and constructed of cloth waterproofed with raw linseed oil, and the sides were of clear plastic material. A cloth skirt, with drawstring, was attached to the bottom hoop of each lantern. Such lanterns are cheap to construct, and easily portable, weighing only five pounds each. They can be erected in the field on a bamboo pole of suitable length with crossbar and pulley attachment, though care is necessary to secure them firmly to the pole to prevent undue movement in high winds.

In operation, such lanterns were erected over the female arrows in the field and the required male arrows were introduced, tied in a suitable position, and maintained with the cut ends of the canes in preservative solution to allow pollen shedding, The male arrows were changed every three or four days to ensure a continuous supply of pollen during the flowering period of the female arrows.

A Mauritius-type lantern was also constructed, for comparison with the new type and the standard Barbados lanterns.

The new design proved promising—in one cross, 385 seedlings were obtained from a single female arrow—but further trials are necessary before it can be finally adopted for regular use.

### 2. Preservative Solutions for use with Modified Lanterns

The Hawaiian method, using both female and male arrows in preservative solution, has been tried in Barbados on previous occasions without success. However, for use with the modified lanterns described above, which are erected over the female arrows *in situ*, all that is required is a method of preserving male arrows sufficiently long for the shedding of normal pollen.

Solutions tested were the standard Hawaiian sulphurous-phosphoric solution, and the organo-mercurial Aretan, at 0.03%, 0.01% and 0.005%.

In the experiments, all leaf blades except the last were removed to minimise transpiration, and the ends of the cut canes were trimmed under water and placed at once in the solutions, which were maintained in bamboo pots previously treated with bituminous paint.

The Aretan solution at 0.01% proved equally as effective as the Hawaiian solution, and was far easier to prepare. In it, normal pollen shedding took place for three to four days—in some cases for as long as six days.

Further experiments, using other preservative solutions, are planned before a routine breeding method with the modified lanterns is introduced.

## III. PERFORMANCE OF VARIETIES IN CONTRIBUTING COLONIES

### Barbados

In commercial cultivation in Barbados, the variety situation was characterised by a further decrease in the area under the dominant variety, B.37161, which has now fallen to 73% of the 1954 crop. B.37161 is a general purpose cane which has been cultivated extensively in all ecological categories, and has served the Barbados Sugar Industry well for the past decade. B.41211 is the next most important variety on the list, occupying about 12½% of the cane acreage for the 1954 crop. This variety is rather limited in its scope, as it is heavily damaged by rats and weevil borer in the higher rainfall areas, and juices are consequently poor. It is mainly cultivated in the low and intermediate rainfall areas where ripening conditions are good and the pests mentioned above not so prevalent. This variety has given exceptionally heavy yields, but is unlikely ever to exceed 25% of the Island's crop, as juice maxima in the plant crop are maintained over a relatively short period. B.4098, a variety with an excellent juice, occupied 7.70% of the 1954 crop. It is mainly grown on the deeper Group II soils of the intermediate rainfall areas, where arrowing is not a limiting factor. Under these conditions it has given excellent yields of plant and ratoon cane.

The new varieties, B.45151, B.4744 and B.47419, all appear in the 1954 variety table for the first time. B.45151 has an outstanding juice and has been recommended for early reaping in the high rainfall areas. However, it is not necessarily an early ripening cane, and indeed its juice quality later in the crop is outstanding. B.4744 has given heavy plant cane and ratoon yields in the high and intermediate rainfall areas, but ratoon yields in the low rainfall areas have been disappointing. This variety suffers during dry spells, but recovers quickly following rain. B.47419 is capable of giving good yields of plant and ratoon cane in the high and intermediate rainfall areas. It does not perform so well in the low rainfall areas but appears to withstand dry spells better than B.4744.

The cane root mealy bug has been spreading rapidly during the past two years and can now be found over considerable areas of the Island. It is capable of causing an almost complete loss of crop in second and older ratoon fields and a considerable reduction in the plant cane and first ratoon crops. This pest undoubtedly accounted for a considerable loss in the 1954 crop which amounted to the equivalent of 178,960 tons of sugar.

Variety percent acreage figures for the 1953 and 1954 crops are as follows:—

| | 1953 | 1954 |
|---|---|---|
| B.37161 ... ... ... ... ... | 76.04 | 73.13 |
| B.41211 ... ... ... ... ... | 12.54 | 12.60 |
| B.4098 ... ... ... ... ... | 7.39 | 7.70 |
| B.41227 ... ... ... ... ... | 1.01 | 1.22 |
| B.43391 ... ... ... ... ... | 1.04 | 1.03 |
| B.45151 ... ... ... ... ... | — | 0.72 |
| B.4744 ... ... ... ... ... | — | 1.24 |
| B.47419 ... ... ... ... ... | — | 0.22 |
| Others ... ... ... ... ... | 1.78 | 2.14 |

**British Guiana**

Following the discovery of 'Leaf Scald' Disease in British Guiana over practically the whole of the cane growing area of that Colony, a change over from the susceptible to more resistant varieties was inevitable. This change has taken place rapidly over the past few years. The susceptible variety, B.34104, which represented 60% of the 1952 crop had fallen to 31% by 1954. Similarly, D.14/34 has fallen from 8.6% to 2.5% over the same period. These varieties have been replaced mainly by the varieties, B.41227, B.37161 and B.4098. The two former are described as susceptible-tolerant, while the latter is said to be resistant. B.41227 has given excellent yields of cane and sugar in trials as well as on a commercial scale, and would have eventually replaced B.34104. However, the susceptibility of B.34104 to 'Leaf Scald' has, no doubt, hastened the process. The juice quality of B.37161 is reported to be variable, and is suspected to be associated with rotting of the canes. It has been recommended that fields of this variety should be cut at twelve months or before. B.37161 appears to perform particularly well along the Demerara River and in many areas on the West Coast Demerara Estates as well as on pegassy soils. The performance of B.4098 in trials has not been as good as that of B41227, although its juice quality is in the same class. However, B.4098 is resistant to 'Leaf Scald' Disease, and therefore must find a place in commercial plantings.

The large number of breeding and commercial varieties which have been sent to British Guiana have now been tested and classified as susceptible resistant or tolerant to 'Leaf Scald' Disease. This is a big step forward and will be of great value in drawing up the breeding programme.

Variety percent acreage figures for the 1952, 1953 and 1954 crops are given below:—

| | 1952 | 1953 | 1954 |
|---|---|---|---|
| B.34104 ... ... ... | 60.2 | 47.7 | 31.0 |
| B.41227 ... ... .. | 12.7 | 21.7 | 30.5 |
| B.37161 ... ... ... | 9.4 | 14.4 | 18.9 |
| B.4098 ... ... ... | 1.3 | 4.6 | 9.2 |
| D.14/34 ... ... ... | 8.6 | 4.9 | 2.5 |
| B.4362 ... ... ... | — | 0.5 | 2.0 |
| Co.419 ... ... ... | 1.7 | 1.4 | 1.5 |
| B.40105 ... ... ... | 0.5 | 0.7 | 0.8 |
| D.158/41 ... ... ... | 0.3 | 0.4 | 0.5 |
| D.62/43 ... ... ... | — | 0.3 | 0.4 |
| D.37/45 ... ... ... | — | — | 0.3 |
| Others ... ... ... | 1.2 | 1.0 | 1.1 |

**Jamaica**

During the past three seasons, the area under B.34104 dropped from 54% to 26.47% of the total acreage. This variety is highly susceptible but tolerant to mosaic, and is being eliminated. The area under B.3439 has also decreased somewhat. It now occupies 17.95% of the total area against 22% in 1951. This variety is still grown successfully in parts of the North Coast, where it is being replaced to some extent by Co.331 and Co.421, and as an early ripening cane in the irrigated areas. B.37172, which was at its best in the very wet conditions of the east and north-east parts of the Island, is now reported to be suffering severely from chlorotic streak. B.41227 is rapidly assuming importance as a main crop cane on the irrigated areas of the south and central parts of the Island. It is capable of giving heavy yields of cane and sugar. This variety is also reported to be susceptible to chlorotic streak. B.4362, another variety which has been expanded rapidly within the past few years, is attacked to a limited extent by a severe strain of mosaic disease and is reported to be susceptible to red rot, mottled stripe, chlorotic streak and Fusarium top rot. It may have to be eliminated from cultivation. B.42231 is another variety being planted on an increasing scale. It, however, tends to flower profusely, and is therefore only suitable for fall planting. It grows well under swampy and saline conditions and has a very good juice.

The variety percent acreage figures for the 1952, 1953 and 1954 crops are given below:—

| | 1952 | 1953 | 1954 |
|---|---|---|---|
| B.3439 ... ... ... ... | 21 | 21 | 17.95 |
| B .34104 ... ... ... ... | 49 | 35 | 26.47 |
| B.37161 ... ... ... ... | 6 | 8 | 8.43 |
| B .37172 ... ... ... ... | 8 | 8 | 7.90 |
| B .41227 ... ... ... ... | 1 | 5 | 10.01 |
| B.42231 ... ... ... ... | 2 | 4 | 6.81 |
| B.4362 ... ... ... ... | 1 | 5 | 9.68 |
| P.O.J.2878 ... ... ... ... | 1 | 1 | 0.86 |
| Mixed and others ... ... ... | 10 | 12 | 11.89 |

**Trinidad**

The variety, B 3337, continues to occupy about one-third of the cane acreage of Trinidad but has decreased some 3% since 1951, after advancing about 2% for the 1952 crop. It is not cultivated in any of the other British West Indian Islands.

and is grown mainly on some of the northern estates in Trinidad. The area under B.34104 has continued to decline during the period under review. Yield figures indicate that it is generally inferior to the newer B. varieties.

The variety B.37161 has maintained its acreage fairly steadily over the past three years, while B.37172 has increased in popularity and may soon replace B.3337 as the most important variety in Trinidad. The area under B.4098 has been reduced somewhat over the past few years, while that under B.41227 has remained constant at a very low percentage. Both of these varieties are capable of giving heavy yields of cane, particularly B.41227, but its juice quality under Trinidad conditions is not as good as it might be. B.4362 has come into the varitey picture during the period under review, but still only occupies slightly more than 1% of the acreage cut in the 1954 crop.

Variety percent acreage figures for the 1952, 1953 and 1954 crops are given below:—

| | 1952 | 1953 | 1954 |
|---|---|---|---|
| B.3337 ... ... ... ... | 38.32 | 36.10 | 34.02 |
| B.34104 ... ... ... ... | 22.72 | 16.88 | 12.46 |
| B.37161 ... ... ... ... | 21.06 | 21.22 | 20.74 |
| B.37172 ... ... ... ... | 12.12 | 20.49 | 27.71 |
| B.4098 ... ... ... ... | 2.09 | 1.17 | 0.98 |
| B.41227 ... ... ... ... | 0.81 | 0.61 | 0.71 |
| B.4362 ... ... ... ... | 0.11 | 0.88 | 1.18 |
| B.H.10(12) ... ... ... ... | 1.01 | 0.55 | 0.71 |
| Others ... ... ... ... | 1.76 | 2.10 | 1.49 |

**Antigua**

B.4098 continues to dominate the sugar cane acreage in Antigua. It yields well and gives good quality juice under Antigua's rainfall conditions over a wide range of soil types. In spite of the fact that the variety was reported to have suffered severely in a recent hurricane, the area under B.4098 has continued to expand until it occupied 83.54% for the 1954 crop. This expansion has been principally at the expense of B.37161 and B. 34104. B.37172 continues to give good results on Blubber Valley Clays.

Variety percent acreage figures for the 1952, 1953 and 1954 crops are given below:—

| | 1952 | 1953 | 1954 |
|---|---|---|---|
| B.37161 ... ... ... ... | 24.81 | 17.37 | 11.31 |
| B.4098 ... ... ... ... | 64.58 | 75.01 | 83.54 |
| B.3439 ... ... ... ... | 3.54 | 3.80 | 2.19 |
| B.34104 ... ... ... ... | 2.75 | 1.20 | 0.83 |
| B.37172 ... ... ... ... | 4.00 | 1.23 | 2.08 |
| Others ... ... ... ... | 0.32 | 1.39 | 0.05 |

**St. Kitts**

As in previous years, St. Kitts has shown a similar trend to Barbados in variety plantings. The area under B.37161 has been appreciably reduced, although it still represents the majority of the cane acreage. B.41211 has been expanded considerably and continues to increase in popularity. B.34104, after falling to 1.63% of the cane acreage in 1951, appears to be making a recovery, and occupied 5.34%

of the area reaped in 1954. However, new plantings of this variety are likely to decrease rather than expand. B.41227 is being planted on a small scale, as is B.45151. B.4098 tends to uproot badly in St. Kitts, and so will never be of much importance there.

Variety percent acreage figures for the 1952, 1953 and 1954 crops are given below:—

| | 1952 | 1953 | 1954 |
|---|---|---|---|
| B.37161 ... ... ... ... | 83.94 | 76.95 | 69.20 |
| B.34104 ... ... ... ... | 2.98 | 4.37 | 5.34 |
| B.4098 ... ... ... ... | 0.08 | 0.05 | 0.06 |
| B.41211 ... ... ... ... | 8.38 | 13.52 | 19.89 |
| B.3337 ... ... ... ... | 1.46 | 2.01 | 2.45 |
| B.41227 ... ... ... ... | 0.26 | 0.60 | 0.80 |
| Mixed and Others ... ... ... | 2.90 | 2.50 | 2.26 |

The tendency for longer ratooning to be practised in St. Kitts, which was reported in 1951, has been continued and extended during the period under review. The powerful ratooning capabilities of the newer seedlings now in use have played their part in lowering production costs. The figures for plant and ratoon percentages over the past seven years are given below:—

| | 1948 | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 |
|---|---|---|---|---|---|---|---|
| Plant ... | 38.14 | 34.89 | 38.77 | 35.47 | 31.87 | 26.87 | 21.51 |
| 1st Ratoons ... | 43.99 | 38.35 | 32.07 | 36.18 | 32.74 | 28.33 | 24.39 |
| 2nd Ratoons ... | 15.41 | 20.62 | 19.05 | 17.04 | 22.53 | 23.41 | 25.80 |
| 3rd Ratoons ... | 2.46 | 5.92 | 9.66 | 9.66 | 9.50 | 15.14 | 17.68 |
| 4th Ratoons ... | — | 0.22 | 0.45 | 1.65 | 3.36 | 4.81 | 7.64 |
| 5th Ratoons ... | — | — | — | — | — | 0.97 | 2.32 |
| 6th Ratoons ... | — | — | — | — | — | 0.47 | 0.59 |
| 7th Ratoons ... | — | — | — | — | — | — | 0.07 |

**St. Lucia**

Owing to the long ratooning practised in St. Lucia, varietal changes are much more gradual than in Colonies with a shorter cycle. B.37161 is the main variety, with B.37172 increasing rapidly in importance. The latter is particularly suited to the St. Lucia conditions on account of its excellent juice quality. The area under B.4362 is also increasing steadily. It has done fairly well, but arrows heavily and is reported to be better suited to some soil types than others. However, it fills the role of an early ripening variety which gives a reasonable juice at the beginning of crop. The areas under B.4098, B.H.10(12) and B.34104 are steadily declining, and these varieties will probably disappear from cultivation.

Variety percent acreage figures for 1952 and 1953 are given below:—

| | 1952 | 1953 |
|---|---|---|
| B.37161 ... ... ... ... | 36.0 | 38.7 |
| B.37172 ... ... ... ... ... ... | 15.6 | 23.3 |
| B.H.10(12) ... ... ... ... ... | 15.8 | 11.1 |
| B.4362 ... ... ... ... ... ... | 11.3 | 16.5 |
| B.3337 ... ... ... ... ... ... | 1.3 | 1.5 |
| B.4098 ... ... ... ... ... ... | 8.4 | 5.1 |
| B.41227 ... ... ... ... ... ... | 2.0 | 1.0 |
| B.34104 ... ... ... ... ... ... | 6.8 | 1.8 |
| Others ... ... ... ... ... ... | 2.8 | 1.0 |

Figures for the 1954 crop are not available.

# IV. CYTOGENETICIST'S ANNUAL REPORT

## A. Introductory

This report covers the period September 1953—June 1954, and brings to a conclusion the first five-year period of research. Statements of policy for the pure-line breeding work and cytogenetics research were set out in the 1952—53 report.

## B. Field Work

### *I. Pure-line Breeding*

The 1953 breeding season was a most successful one, in that a large number of the selfed lines arrowed, and of these, the large majority proved male-fertile and could therefore be selfed. Varying degrees of self-sterility were encountered, as is to be expected in such work when mainly with hybrids, but several large populations of seedlings were obtained, and sufficient were available in most selfings for adequate selection and progress in pure-line development. Details of the selfings, inbred-crosses (in cases where desirable seedlings proved to be male-sterile), seedlings obtained, and seedlings planted in the field nursery, are shown in Table I.

TABLE I

| FOUNDATION VARIETY | SELFINGS | Seedlings Produced | Seedlings Planted |
|---|---|---|---|
| B.35276 ... ... | B.51 B.11 ... ... ... | 41 | 37 |
| ,, ... ... | B.51 B.15 ... ... ... | 18 | 14 |
| ,, ... ... | B.51 B.22 ... ... ... | 64 | 49 |
| ,, ... ... | B.51 B.42 ... ... ... | 48 | 37 |
| ,, ... ... | B.51 B.43 ... ... ... | 8 | Nil |
| ,, ... ... | B.51 B.44 ... ... ... | 39 | 28 |
| B.4098(a) ... ... | B.49 C.3 ... ... ... | 600 | 112 |
| ,, ... ... | B.49 C.5 ... ... ... | 127 | 108 |
| ,, ... ... | B.51 C.13 ... ... ... | 1,728 | 142 |
| ,, ... ... | B.51 C.15 ... ... ... | 29 | 22 |
| ,, ... ... | B.51 C.41 ... ... ... | 70 | 59 |
| B.3337 ... ... | B.51 E.22 ... ... ... | Nil | Nil |
| B.44234 ... ... | B.50 G.1 ... ... ... | 41 | 21 |
| B.4098(b) ... ... | B.51 P.12 ... ... ... | 85 | 77 |
| B.41242 ... ... | B.51 Q.11 ... ... ... | 31 | 22 |
| B.34104 ... ... | B.51 R.33 ... ... ... | 320 | 110 |
| B.4098(c) ... ... | B.50 T.2 ... ... ... | 3 | Nil |
| | INBRED–CROSSES | | |
| B.3337 ... ... | B.51 E.24 x B.49 E.3 ... ... | 22 | 15 |
| B.44234 ... ... | B.50 G.3 x B.50 G.1 ... ... | 32 | 21 |
| B.34104 ... ... | B.49 R.1 x B.49 R.3 ... ... | 250 | 178 |
| ,, ... ... | B.51 R.32 x B.49 R.3 ... ... | 95 | 82 |
| TOTALS ... ... ... ... ... | | 3,651 | 1,134 |

Selections from the previous year's nursery plantings were made in December and planted direct into the breeding plots at Groves. From a large population of B.49 D2 selfs (B.41211 line) five were selected. They showed only very slight variation, and it is evident that vegetative characters are becoming fixed early in this line. On the other hand, first selfings of B.4362 showed wide variation, and the five selections from this population differed considerably in cane colour and growth-type. An interesting series of second-generation selfs from B.50 U1, in the B.37161 line, allowed of useful progress in development of pure-line derivatives from this famous commercial variety.

As in previous years, brix readings were recorded late in the crop season for all pure-line material in the breeding plots. Corroboration was obtained for the statement in the 1952—53 report that juice quality is in general well maintained in selfed lines. Of special promise as regards juice quality are the various lines in the C. and P. series (both from foundation parent B.4098) in the E. series (from B.3337) and the R. series (from B.34104). Indifferent or low juice qualities were indicated only in the Q. series (from the *glagah* nobilisation B.41242) and the S. series (from the *robustum* derivative B.4454). Although less data are available, as the lines were started later, indications are that two other lines from B.4098 and B.34104 respectively (T. and H. series) are promising as producers of high-juice-quality individuals.

Several interesting features have emerged from a detailed consideration of the different lines which are being evolved. For instance, non-arrowing or very light-arrowing lines are being developed from B.41211 and B.41227, both of which arrow heavily in Barbados. These lines, which appear to differ little from the foundation varieties except in regard to arrowing, might be useful in breeding, or might in some cases be tested directly as commercial varieties. A self-trashing line has segregated from B.35276, and if the characteristic is fixed early, the line could be used to confer this useful feature on seedlings desirable in other respects.

Progress towards homozygosity is rather slow in lines from interspecific hybrids, and although a good advance has been made, so far the material has not been considered ready for use in hybridisation for the immediate production of commercial varieties. However, certain of the lines are sufficiently advanced for use within the next few years in top-crosses with standard female varieties, and for inter-crossing among themselves in preliminary experiments.

### *II. Breeding Methods*

In collaboration with the Botanist, experiments were made to evolve suitable breeding techniques which would be less expensive in material and labour than those at present in general use. A different and much less expensive type of breeding lantern was devised and tested, which was constructed of a light framework and plastic covering. The results showed that such a lantern should serve the purpose providing a heavier gauge of plastic sheeting could be obtained for covering it.

To avoid the inconvenience and expense of daily collection of male arrows during the breeding season, and hand pollination of the female arrows, experiments were made with sulphurous-phosphoric acid (the Hawaiian solution) and Aretan at several dilutions as preservatives for male arrows during the pollen-shedding period. Previous experience had proved that such solutions could not be relied upon to preserve female arrows through the pollination and fuzz-maturation stages. The results were promising in showing that in 0.03% Aretan, which is simpler to prepare than the Hawaiian solution and is stable, good pollen-shedding could be ensured for three or four days. A series of enzyme inhibitors is being obtained for experi-

ments in the next breeding season, and it is hoped that a method might be evolved by which arrows could be maintained in good condition for the whole pollen-shedding period of about 10—12 days.

## C. Laboratory Work

### *I. Cytological Technique*

For chromosome counting, the technique devised previously, and described in the 1952—53 report, continued to give satisfactory results.

Preparations made from the growing-points of developing buds showed that such tissues are inferior to root-tip material as a source of mitoses for chromosome study.

Root-tip squashes were prepared from material subjected to various pre-treatments, maceration schedules and staining methods. Satisfactory results were sometimes obtained from root-tips bulk-stained with the Feulgen reagent after extended hydrolysis, and from material squashed in aceto-carmine or lacmoid after maceration in conc. HCl: 95% alcohol, gradually warming to about 60°C for ten minutes. No satisfactory routine schedule has, however, been developed, and the conclusion is that sugar cane root-tip material in Barbados is not readily susceptible to effective maceration, as the useful stage between under-maceration (where cells will not separate readily on squashing) and over maceration (where cell-contents are affected or destroyed) is very narrow. This may be due to the high pH of the Barbados soils and water, or to some other reason: whatever the cause, the fact is that methods reported to give success with sugar cane and other Gramineae elsewhere have been found unreliable or useless in Barbados.

Exhaustive tests were made with the phase-contrast equipment. Conclusions were that the apparatus does not represent an improvement over the standard methods of microscopy for chromosome counting in high polyploids and aneuploids. It is, however, useful for examination of understained and faded crystal violet preparations and for rapid examination of unprocessed material, as for instance in a search for haploids, where actual chromosome counting is not necessary. In the latter case, haploids could be indentified from an examination of fresh material in 45% acetic acid from the general appearance of metaphase plates.

### *II. Results*

Various chromosome counts were made for introduced varieties, as follows:—

| | | |
|---|---|---|
| Tukuyu | (*S. spontaneum*) ... ... ... | 124 |
| 28 NG.7 | (*Erianthus arundinaceus*) ... ... | 60 |
| CP.36–116 | (La. Purple x noble cane) ... ... | 80 |
| P.O.J.2878 | (P.O.J.2364 x E.K.28) ... ... ... | 121 |
| C1.41–223 | (F.31–436 x F.31–452 (sib) ) ... ... | 99 |
| H.32–1063 | (P.O.J.2878 x 28–4399) ... ... | 114 |
| Ajax | (Badila x noble cane) ... ... ... | 80 |
| M.134/32 | (P.O.J.2878 x D.109) ... ... ... | 97 |
| P.R.1000 | (P.O.J.2878 x Co.281) ... ... ... | 119 |

The variety CP.36–116 was originally reported to be from the cross La. Purple x 28 NG.7, but shows little evidence of other than noble cane characteristics, and the chromosome count shows that it is not an *Erianthus* hybrid. Chromosome counts for P.O.J.2878 varying from 120 to 124 have been published in the literature: 121 appears to be the correct count. Tukuyu 2 shows the highest chromosome number of any of the forms of *S. spontaneum* in Barbados.

Cytological work in connection with the pure-line breeding programme was continued. B.37193, a sib of B.37161 and a foundation variety in the U line was found to have the same chromosome number as B.37161 (108). Other counts for material in the pure lines were as follows:—

| | | |
|---|---|---|
| In B.35276 (120) line ... ... ... | B.51 B.22 | — 104 |
| | B.51 B.23 | — 107 |
| | B.51 B.42 | — 108 |
| | B.49 B. 4 | — 110 |
| | B.51 B.15 | — 112 |
| | B.51 B.44 | — 114 |
| In B.4098 (109) line I ... ... ... | B.51 C.42 | — 108 |
| | B.49 C. 5 | — 109 (ca) |
| | B.51 C.41 | — 110 |
| | B.51 C.13 | — 112 |
| | B.51 C.15 | — 112 |
| In B.3337 (118) line ... ... ... | B.51 E.24 | — 110 |
| In B.4098 (109) line II ... ... ... | B.50 T. 1 | — 106 |
| In B.37161 (108) line ... ... ... | B.50 U. 1 | — 109 |
| | B.50 U. 2 | — 110 |
| In B.4098 (109) line III ... ... ... | B.49 P. 1 | — 110 |
| | B.51 P.12 | — 110 |
| In B.34104 (100) line ... ... ... | B.49 R. 3 | — 96 |

It will be observed that, as reported for previous years' counts, selfed derivatives from interspecific hybrids frequently show a few chromosomes less than the foundation varieties, probably on account of non-inclusion of univalents in the gametes. On the other hand, there is sometimes an increase in chromosome number, also on account of meiotic irregularity.

The results of the cytological work with inbred material indicate that, for most of the lines, the tendency is towards a stabilisation of chromosome number at about 110—112. This number represents some 30—32 chromosomes more than the complement of the noble canes (*S. officinarum*) which were formerly the commercial varieties. How many of these extra chromosomes are accounted for by duplication of the 'noble' chromosomes, derived from the original 'nobilisation', and how many are *S. spontaneum* chromosomes or other non-noble chromosomes from hybridisation, cannot be stated with certainty, as it is impossible by any technique at present available to distinguish *in Saccharum* between the different chromosomes on account of their small size. The *S. spontaneum* chromosomes carry genes for growth vigour, good ratooning, and resistance to mosaic and other diseases, and from the type and behaviour of the individuals in the pure lines it is evident that some of the chromosomes in the complements are non-noble ones.

*III. Chromosome arrangement in prophase*

The standard textbooks on plant cytology state that in prophase the chromosomes are distributed throughout the cytoplasm of the nucleus, (*e.g.* Darlington, C.D. —"Recent Advances in Cytology", 2nd Edn. p. 26.). Preparations made in Barbados show that this is not so in *Saccharum*, where from the earliest prophase stages, as

soon as individual chromosomes are recognizable, they are arranged around the outside of the nucleus apparently immediately inside the nuclear membrane: there is evidently mutual repulsion between the chromosomes, which are evenly spaced round the nuclear membrane. With suitable staining and differential focussing it has sometimes been possible to make chromosome counts from prophase nuclei. The same arrangement occurs in Zea, and probably in other genera.

*IV. Stem Epidermis Patterns*

The methods of obtaining and examining preparations of stem epidermis, and the classification of the patterns, have been given in previous annual reports. During the period under review, many additional preparations were made from introduced varieties, Barbados seedlings and pure-line material, and corroboration was obtained for the main conclusions already reached. In all, more than one hundred and thirty preparations have been made and are available for study: these include specimens from noble varieties (both locally bred and introduced), from several forms of *S. spontaneum*, *S. barberi*, *S. sinense* and *S. robustum*, and from hybrids varying from simple nobilisations to complex tri-species seedlings.

Several different pattern-types are recognizable, the criterion of differentiation being mainly the frequency of occurrence and the arrangement of silica-cells in the patterns, and the regularity of occurrence and the shape of the cork-cells. While a few varieties have characteristic patterns, the majority can only be referred to one of the pattern-types. Nevertheless, stem epidermis preparations are a useful auxiliary in variety description and identification, and as they are permanent, can be stored easily for reference purposes.

*D. Publications*

A bulletin entitled "Sugar Cane Varieties in Barbados: an Historical Review" was published in January, 1954. This gives details of the early history of the sugar cane in the Island, the introduction of the different important varieties, the discovery of sugar cane seedlings, and the beginnings of cane breeding work. It also outlines the various phases of the breeding work which led up to the present comprehensive breeding programme, and concludes with sections on the pure-line breeding and cytogenetics research, and the main trends in commercial planting.

A review article entitled "Reflections on the Evolution of a Philosophy of Sugar Cane Breeding in Hawaii" was published in the June, 1954, issue of "SUGAR". In this an attempt was made to reconcile the differences which exist between the Hawaiian and Barbadian views on several fundamental points concerning the choice of parent varieties and the breeding and testing methods employed.

## V. STATEMENT OF EXPENDITURE FOR 1953—54

| | | | |
|---|---|---|---|
| 1. | *Recurrent* | | |
| | 1. Personal Emoluments ... ... ... ... ... ... | | $17,561.35 |
| | 2. Provident Fund ... ... ... ... ... ... ... | | 859.20 |
| | 3. Seedling Trials ... ... ... ... ... ... | | 26,998.84 |
| | 4. Stationery and Library ... ... ... ... ... ... | | 1,326.17 |
| | 5. Travelling ... ... ... ... ... ... ... | | 3,405.64 |
| | 6. Entertainment ... ... ... ... ... ... ... | | 24.00 |
| | 7. Rent of Land ... ... ... ... ... ... ... | | 598.50 |
| | 8. Incidentals ... ... ... ... ... ... ... | | 950.18 |
| | | | $51,723.88 |
| 2. | *Non-Recurrent* | | |
| | Irrigation ... ... ... ... ... | $ 4,459.48 | |
| | Arrow Lanterns ... ... ... ... | 451.39 | |
| | Stencil Machines ... ... ... ... | 70.98 | |
| | | $4,981.85 | 4,981.85 |
| | TOTAL ... ... ... ... ... ... | | $56,705.73 |

## APPENDIX I

SUGAR CANE BREEDING, SEEDLING RAISING AND FIELD NURSERY PLANTING. B.56′ SERIES AND SHORT SEASON FIRST YEAR TRIAL — B.55′ SERIES

**Details of Crosses made, their Germinations, Numbers Potted and Numbers Planted in the Field Nursery and in the B.55′ Series Short Season First Year Seedling Trial**

| CROSS | GROUP | No. Germinated | No. Potted | | No. Planted in Field Nursery | | No. Planted in First Year Trial |
|---|---|---|---|---|---|---|---|
| | | | Singles | Bunches | Singles | Bunches | |
| | *S. officinarum x S. spontaneum* | | | | | | |
| Ba.11569 x B.44131... | 2nd Nobilisation Glagah ... ... | 59 | 59 | — | 44 | — | — |
| B.44130 x B.603 ... | ,, ,, ,, ... ... | 1,482 | 216 | — | 116 | — | — |
| B.44132 x B.603 ... | ,, ,, ,, ... ... | 2,754 | 306 | — | 149 | — | — |
| B.3439 x B.3337 ... | 3rd Nobilisation Glagah ... ... | 3,746 | 1,132 | — | 540 | — | 200 |
| B.37172 x P.O.J.2878 | ,, ,, ,, ... ... | 3 | — | — | — | — | — |
| B.48361 x B.391 ... | ,, ,, ,, ... ... | 66 | 66 | — | 58 | — | — |
| B.49282 x B.391 ... | ,, ,, ,, ... ... | 1 | — | — | — | — | — |
| B.4145 x P.O.J.2878 | 4th Nobilisation Glagah ... ... | 115 | 115 | — | 92 | — | — |
| B.38212 x P.O.J.2878 | ,, ,, ,, ... ... | 796 | 398 | — | 300 | — | — |
| Ba.11569 x B.48392... | Noble x Glagah x Local ... | 103 | 103 | — | 90 | — | — |
| B.37172 x B.41211... | ,, x ,, x ,, ... ... | 270 | 135 | — | 102 | — | — |
| B.4196 x B.37254... | ,, x ,, x ,, ... ... | 15 | 15 | — | 14 | — | — |
| Co.421 x B.41211... | ,, x ,, x ... ... | 5,010 | 501 | 860 | 326 | 800 | 100 |
| B.39157 x B.41203... | Noble x Glagah x Celebes ... | 19 | 19 | — | — | — | — |
| B.4642 x B.3915 ... | ,, x ,, x ,, ... | — | — | — | — | — | — |
| B.3439 x B.48394... | Noble x Glagah x Local x Celebes | 438 | 438 | — | 150 | — | — |
| Co.421 x B.39156... | ,, x ,, x ,, x ,, ... | 2,568 | 428 | — | 320 | — | — |
| | | 17,445 | 3,931 | 860 | 2,301 | 800 | 300 |
| | *S. officinarum x S. barberi* | | | | | | |
| Co.213 x B.603 ... | 3rd Nobilisation Chunnee | 1 | — | — | — | — | — |
| | *S. officinarum x S. spontaneum x S. barberi* | | | | | | |
| Ba.11569 x B.4362 ... | Noble x Glagah x Chunnee ... | 220 | 220 | — | 138 | — | — |
| B.3439 x B.4362 ... | ,, x ,, x ,, ... ... | 44 | 44 | — | 37 | — | — |
| B.35207 x P.O.J.2878 | ,, x ,, x ,, ... ... | 198 | 198 | — | 178 | — | — |
| B.37161 x B.37175... | ,, x ,, x ,, ... ... | — | — | — | — | — | — |
| B.37161 x B.39220... | ,, x ,, x ,, ... ... | 9 | — | — | — | — | — |
| B.37161 x P.O.J.2714 | ,, x ,, x ,, ... ... | — | — | — | — | — | — |
| B.37161 x P.O.J.2878 | ,, x ,, x ,, ... ... | 98 | 98 | — | 83 | — | — |
| B.4145 x B.4362 ... | ,, x ,, x ,, ... ... | 127 | 127 | — | 100 | — | — |
| B.4362 x B.41227... | ,, x ,, x ,, ... ... | 378 | 378 | — | 180 | — | — |
| B.4362 x B.49378... | ,, x ,, x ,, ... ... | 2 | — | — | — | — | — |
| B.4547 x B.603 ... | ,, x ,, x ,, ... ... | 36 | 36 | — | 36 | — | — |
| Ba.11569 x B.47419... | Noble x Glagah x Local x Chunnee | 140 | 140 | — | 113 | — | — |
| B.3353 x B.4744 ... | ,, x ,, x ,, x ,, ... | 66 | 66 | — | 41 | — | — |
| B.3353 x B.47419... | ,, x ,, x ,, x ,, ... | 3,437 | 982 | 406 | 399 | 350 | 200 |
| B.3365 x B.4744 ... | ,, x ,, x ,, x ,, ... | 7 | — | — | — | — | — |
| B.3365 x B.47419... | ,, x ,, x ,, x ,, ... | 1,464 | 306 | 293 | 150 | 250 | 100 |
| B.3365 x Co.421 ... | ,, x ,, x ,, x ,, ... | 215 | 165 | — | 140 | — | — |
| B.3439 x B.45236... | ,, x ,, x ,, x ,, ... | 2,872 | 314 | 364 | 150 | 240 | — |
| B.34102 x B.47419... | ,, x ,, x ,, x ,, ... | 6,000 | 400 | 1,158 | 150 | 800 | — |
| B.35206 x B.4098 ... | ,, x ,, x ,, x ,, ... | 1,884 | 314 | 467 | 150 | 400 | — |
| B.37161 x B.4098 ... | ,, x ,, x ,, x ,, ... | 573 | 365 | 118 | 200 | 117 | 100 |
| B.37161 x B.47112... | ,, x ,, x ,, x ,, ... | — | — | — | — | — | — |
| B.37161 x B.48259... | ,, x ,, x ,, x ,, ... | 212 | 212 | — | 150 | — | — |

## APPENDIX I (*Cont'd*)

SUGAR CANE BREEDING, SEEDLING RAISING AND FIELD NURSERY PLANTING. B.56′ SERIES AND SHORT SEASON FIRST YEAR TRIAL — B.55′ SERIES

**Details of Crosses made, their Germinations, Numbers Potted and Numbers Planted in the Field Nursery and in the B.55′ Series Short Season First Year Seedling Trial**

| CROSS | GROUP | No. Germinated | No. Potted | | No. Planted in Field Nursery | | No. Planted in First Year Trial |
|---|---|---|---|---|---|---|---|
| | | | Singles | Bunches | Singles | Bunches | |
| B.37161 x B.48372... | Noble x Glagah x Local x Chunnee | 612 | 255 | — | 200 | — | — |
| B.37161 x B.4905 ... | ,, x ,, x ,, x ,, ... | 340 | 271 | — | 200 | — | — |
| B.37161 x B.4995 ... | ,, x ,, x ,, x ,, ... | 113 | 63 | — | 29 | — | — |
| B.37172 x B.4744 ... | ,, x ,, x ,, x ,, ... | 36 | 36 | — | 30 | — | — |
| B.39240 x B.4098 ... | ,, x ,, x ,, x ,, ... | 4 | — | — | — | — | — |
| B.4145 x B.4788 ... | ,, x ,, x ,, x ,, ... | 2,875 | 575 | 542 | 330 | 390 | 100 |
| B.4145 x B.48259... | ,, x ,, x ,, x ,, ... | 510 | 332 | — | 200 | — | — |
| B.4145 x B.50382... | ,, x ,, x ,, x ,, ... | 40 | 40 | — | 27 | — | — |
| B.42279 x B.47419... | ,, x ,, x ,, x ,, ... | 810 | 405 | — | 299 | — | — |
| B.42304 x B.4098 ... | ,, x ,, x ,, x ,, ... | 1,650 | 390 | 466 | 250 | 370 | 100 |
| B.42304 x B.47419... | ,, x ,, x ,, x ,, ... | 6,825 | 455 | 1,543 | 150 | 900 | 100 |
| B.4362 x B.38192... | ,, x ,, x ,, x ,, ... | 104 | 104 | — | 90 | — | — |
| B.4362 x B.4098 ... | ,, x ,, x ,, x ,, ... | 426 | 426 | — | 200 | — | 100 |
| B.4362 x B.49397... | ,, x ,, x ,, x ,, ... | 83 | 83 | — | 37 | — | — |
| B.4362 x Co.290 ... | ,, x ,, x ,, x ,, ... | 133 | 133 | — | 119 | — | — |
| B.4362 x Co.419 ... | ,, x ,, x ,, x ,, ... | 1 | — | — | — | — | — |
| B.43358 x B.47419... | ,, x ,, x ,, x ,, ... | 810 | 405 | — | 100 | — | 100 |
| B.4502 x B.47419... | ,, x ,, x ,, x ,, ... | 1,212 | 302 | — | 200 | — | — |
| B.4502 x P.O.J.2878 | ,, x ,, x ,, x ,, ... | 785 | 471 | — | 252 | — | 99 |
| B.4558 x B.4098 ... | ,, x ,, x ,, x ,, ... | 50 | 50 | — | 47 | — | — |
| B.45104 x P.O.J.2878 | ,, x ,, x ,, x ,, ... | 182 | 182 | — | 123 | — | — |
| B.45117 x B.4744 ... | ,, x ,, x ,, x ,, ... | 180 | 180 | — | 165 | — | — |
| B.45117 x B.47419... | ,, x ,, x ,, x ,, ... | 512 | 222 | — | 150 | — | — |
| B.45121 x P.O.J.2878 | ,, x ,, x ,, x ,, ... | 74 | 74 | — | 60 | — | — |
| B.45170 x P.O.J.2878 | ,, x ,, x ,, x ,, ... | 95 | 95 | — | 72 | — | — |
| B.45170 x B.4744 ... | ,, x ,, x ,, x ,, ... | 422 | 422 | — | 250 | — | 100 |
| B.46103 x B.4098 ... | ,, x ,, x ,, x ,, ... | 102 | 51 | — | 48 | — | — |
| B.46103 x B.4744 ... | ,, x ,, x ,, x ,, ... | 9 | — | — | — | — | — |
| B.46199 x B.47419... | ,, x ,, x ,, x ,, ... | 16 | 16 | — | 14 | — | — |
| B.4733 x B.39220... | ,, x ,, x ,, x ,, ... | 1,224 | 307 | — | 130 | — | — |
| B.47419 x Self ... | ,, x ,, x ,, x ,, ... | 5,000 | 60 | — | 46 | — | — |
| B.4881 x B.4098 ... | ,, x ,, x ,, x ,, ... | 1,182 | 394 | 192 | 299 | 150 | — |
| B.48330 x B.46136... | ,, x ,, x ,, x ,, ... | 339 | 339 | — | 200 | — | — |
| B.48330 x B.50382... | ,, x ,, x ,, x ,, ... | — | — | — | — | — | — |
| B.49353 x B.34104... | ,, x ,, x ,, x ,, ... | 402 | 151 | — | 135 | — | — |
| Co.421 x B.37193... | ,, x ,, x ,, x ,, ... | 623 | 623 | — | 451 | — | 97 |
| Co.421 x B.4098 ... | ,, x ,, x ,, x ,, ... | 1,536 | 192 | 266 | 77 | 263 | — |
| Co.421 x B.40102... | ,, x ,, x ,, x ,, ... | 2,400 | 400 | — | 250 | — | 100 |
| Co.421 x B.4381 ... | ,, x ,, x ,, x ,, ... | 42 | 42 | — | 37 | — | — |
| Co.421 x B.47419... | ,, x ,, x ,, x | 3,765 | 753 | 364 | 380 | 350 | 200 |
| P.O.J.2878 x B.34104... | ,, x ,, x ,, x ,, ... | 540 | 319 | — | 242 | — | — |
| S.45 x B.41227... | ,, x ,, x ,, x ,, ... | 984 | 328 | — | 150 | — | — |
| B.37161 x B.39274 | Noble x Chunnee x Celebes ... | 41 | 41 | — | 24 | — | — |
| Ba.11569 x B.49380 | Noble x Glagah x Celebes x Chunnee ... ... ... | 26 | 26 | — | 22 | — | — |
| Ba.11569 x B.47151 | Noble x Glagah x Celebes x Chunnee ... ... ... | 3 | — | — | — | — | — |
| B.37161 x B.43337 | Noble x Glagah x Celebes x Chunnee ... ... ... ... | 191 | 191 | — | 163 | — | — |
| B.4362 x B.49125 | Noble x Glagah x Celebes x Chunnee ... ... ... ... | 3 | — | — | — | — | — |

## APPENDIX I (*Cont'd*)

SUGAR CANE BREEDING, SEEDLING RAISING AND FIELD NURSERY PLANTING. B.56' SERIES AND SHORT SEASON FIRST YEAR TRIAL — B.55' SERIES

**Details of Crosses made, their Germinations, Numbers Potted and Numbers Planted in the Field Nursery and in the B.55' Series Short Season First Year Seedling Trial**

| CROSS | GROUP | No Germinated | No. Potted | | No. Planted in Field Nursery | | No. Planted in First Year Trial |
|---|---|---|---|---|---|---|---|
| | | | Singles | Bunches | Singles | Bunches | |
| B.3439 x B.43375 | Noble x Glagah x Local x Celebes x Chunnee ... ... ... | 3,915 | 783 | — | 420 | — | 100 |
| B.35247 x B.42231 | Noble x Glagah x Local x Celebes x Chunnee ... ... | 626 | 313 | — | 154 | — | — |
| B.43283 x B.41227 | Noble x Glagah x Local x Celebes x Chunnee ... ... | 2,860 | 327 | 185 | 200 | 150 | — |
| B.43349 x B.47320 | Noble x Glagah x Local x Celebes x Chunnee ... ... ... | 4,214 | 301 | 830 | 93 | 700 | — |
| Co.421 x B.43375 | Noble x Glagah x Local x Celebes x Chunnee ... ... | 2,610 | 435 | 429 | 330 | 407 | — |
| | | 69,519 | 16,728 | 7,623 | 9,840 | 5,837 | 1,596 |
| | *S. officinarum x S. spontaneum x S. barberi x S. sinense* | | | | | | |
| B.39254 x B.34104 | Noble x Local x Chunnee x Sinense ... ... ... | 114 | 114 | — | 104 | — | — |
| B.45152 x B.3915 | Noble x Local x Chunnee x Sinense ... ... ... ... | — | — | — | — | — | — |
| B.47329 x B.603 ... | Noble x Local x Chunnee x Sinense ... ... ... ... | 12 | — | — | — | — | — |
| B.37161 x B.49376 | Noble x Glagah x Local x Chunnee x Sinense ... ... | — | — | — | — | — | — |
| B.39254 x B.4098 ... | Noble x Glagah x Local x Chunnee x Sinense ... ... | 4 | — | — | — | — | — |
| B.39254 x B.4744 ... | Noble x Glagah x Local x Chunnee x Sinense ... ... | 80 | 80 | — | 75 | — | — |
| B.39254 x B.47306 | Noble x Glagah x Local x Chunnee x Sinense ... ... | 153 | 153 | — | 130 | — | — |
| B.4145 x B.49376 | Noble x Glagah x Local x Chunnee x Sinense ... ... | 11 | — | — | — | — | — |
| B.4362 x B.51243 | Noble x Glagah x Local x Chunnee x Sinense ... ... | 8 | — | — | — | — | — |
| B.44111 x B.4098 ... | Noble x Glagah x Local x Chunnee x Sinense ... ... | 56 | 56 | — | 40 | — | — |
| B.44305 x B.4098 ... | Noble x Glagah x Local x Chunnee x Sinense ... ... | 576 | 287 | — | 100 | — | 100 |
| B.45152 x B.47225 | Noble x Glagah x Local x Chunnee x Sinense ... ... | 2 | — | — | — | — | — |
| B.45220 x B.47419 | Noble x Glagah x Local x Chunnee x Sinense ... ... | 918 | 307 | 53 | 170 | 50 | — |
| B.51244 x B.34104 | Noble x Glagah x Local x Chunnee x Sinense ... ... | 163 | 163 | — | 148 | — | — |
| B.47183 x B.46136 | Noble x Glagah x Celebes x Chunnee x Sinense ... ... | 192 | 192 | — | 146 | — | — |
| | | 2,289 | 1,352 | 53 | 913 | 50 | 100 |

## APPENDIX I (*Concluded*)

SUGAR CANE BREEDING, SEEDLING RAISING AND FIELD NURSERY PLANTING. B.56′ SERIES AND SHORT SEASON FIRST YEAR TRIAL — B.55′ SERIES

**Details of Crosses made, their Germinations, Numbers Potted and Numbers Planted in the Field Nursery and in the B.55′ Series Short Season First Year Seedling Trial**

| CROSS | GROUP | No. Germinated | No. Potted | | No. Planted in Field Nursery | | No. Planted in First Year Trial |
|---|---|---|---|---|---|---|---|
| | | | Singles | Bunches | Singles | Bunches | |
| | *S. officinarum x Erianthus arundinaceus* | | | | | | |
| Ba.11569 x 28 NG.7 | 1st Nobilisation Erianthus ... | — | — | — | — | — | — |
| | *S. officinarum x S. barberi x Erianthus arundinaceus* | | | | | | |
| B.37161 x 28 NG.7 | Noble x Chunnee x Erianthus ... | — | — | — | — | — | — |
| | *S. officinarum x S. spontaneum x S. robustum* | | | | | | |
| B.4455 x B.603 ... | Noble x Glagah x Robustum ... | 1,862 | 266 | 109 | 100 | 100 | — |
| B.44233 x B.603 ... | ,, x ,, x ,, ... | 2,110 | 422 | 272 | 200 | 200 | — |
| B.4587 x B.391 ... | ,, x ,, x ,, ... | 72 | 72 | — | 60 | — | — |
| B.49281 x B.603 ... | ,, x ,, x ,, ... | 33 | 33 | — | 24 | — | — |
| | | 4,077 | 793 | 381 | 384 | 300 | — |
| | *S. officinarum x S. spontaneum x S. barberi x S. robustum* | | | | | | |
| B.47388 x B.H.10(12) | Noble x Glagah x Local x Chunnee x Robustum ... ... ... | 125 | 125 | — | 96 | — | — |
| B.35206 x B.47198 | Noble x Celebes x Chunnee x Robustum ... ... ... | 295 | 295 | — | 150 | — | — |
| | | 420 | 420 | — | 246 | — | — |
| | *S. officinarum x S. barberi x S. robustum* | | | | | | |
| B.45198 x B.603 ... | Noble x Chunnee x Robustum ... | 293 | 293 | — | 150 | — | — |
| | GRAND TOTALS ... ... | 94,044 | 23,517 | 8,917 | 13,834 | 6,987 | 1,996 |

## APPENDIX II

### SUGAR CANE FIRST YEAR SEEDLINGS—B.55′ SERIES

**List of Crosses and Number of Seedlings of Each Planted in the Field Nursery (May 1953) and in the First Year Seedling Trial (October 1953)**

| CROSS | GROUP | No. Planted in Field Nursery | No. Planted in First Year Seedling Trial |
|---|---|---|---|
| | *S. officinarum x S. spontaneum* | | |
| Ba.11569 x B.40123 ... | 3rd Nobilisation Local ... ... | 8 | 5 |
| B.3439 x B.3337 ... | 3rd Nobilisation Glagah ... ... | 300 | 111 |
| B.4145 x P.O.J.2878 ... | 4th Nobilisation Glagah ... ... | 199 | 100 |
| B.3439 x B.40123 ... | Noble x Glagah x Local ... ... | 100 | 35 |
| B.37172 x B.41211 ... | ,, x ,, x ,, ... ... | 64 | 30 |
| B.4145 x B.37256 ... | ,, x ,, x ,, ... ... | 14 | 10 |
| B.4145 x B.41211 ... | ,, x ,, x ,, ... ... | 800 | 437 |
| Co.421 x B.41211 ... | ,, x ,, x ,, ... ... | 1,050 | 299 |
| B.3439 x B.43346 ... | Noble x Glagah x Celebes ... ... | 209 | 63 |
| B.43349 x P.O.J.2878 ... | ,, x ,, x ,, ... ... | 100 | 39 |
| B.47179 x P.O.J.2878 | ,, x ,, x ,, ... ... | 120 | 53 |
| | | 2,964 | 1,182 |
| | *S. officinarum x S. spontaneum x S. barberi* | | |
| Ba.11569 x B.45301 ... | Noble x Local x Chunnee ... | 17 | 9 |
| B.3365 x B.34104 ... | ,, x ,, x ,, ... ... | 250 | 80 |
| B.37161 x B.34104 ... | ,, x ,, x ,, ... ... | 44 | 20 |
| B.3353 x B.37193 ... | Noble x Glagah x Chunnee ... | 150 | 50 |
| B.3353 x B.40175 ... | ,, x ,, x ,, ... ... | 150 | 51 |
| B.3353 x B.41227 ... | ,, x ,, x ,, ... | 200 | 70 |
| B.3439 x B.41227 ... | ,, x ,, x ,, ... | 299 | 94 |
| B.3439 x B.4306 ... | ,, x ,, x ,, ... | 150 | 50 |
| B.3439 x B.46136 ... | ,, x ,, x ,, ... | 350 | 120 |
| B.35207 x P.O.J.2878 | ,, x ,, x ,, ... | 500 | 225 |
| B.37161 x B.41227 ... | ,, x ,, x ,, ... | 170 | 80 |
| B.37161 x P.O.J.2878 | ,, x ,, x ,, ... | 89 | 32 |
| B.37172 x B.37193 ... | ,, x ,, x ,, ... | 489 | 89 |
| B.39207 x B.41227 ... | ,, x ,, x ,, ... | 30 | 20 |
| B.39207 x P.O.J.2878 | ,, x ,, x ,, ... | 277 | 173 |
| B.4145 x B.37175 ... | ,, x ,, x ,, ... | 25 | 11 |
| B.4145 x B.37193 ... | ,, x ,, x ,, ... | 300 | 75 |
| B.4145 x B.41227 ... | ,, x ,, x ,, ... | 653 | 388 |
| B.42304 x B.37193 ... | ,, x ,, x ,, ... | 500 | 177 |
| B.4362 x B.37193 ... | ,, x ,, x ,, ... | 497 | 120 |
| B.4362 x B.40175 ... | ,, x ,, x ,, ... | 200 | 80 |
| B.4362 x P.O.J.2878 | ,, x ,, x ,, ... | 589 | 200 |
| B.4558 x P.O.J.2878 | ,, x ,, x ,, ... | 249 | 40 |
| B.46199 x B.37193 ... | ,, x ,, x ,, ... | 10 | 6 |
| B.50151 x B.41227 ... | ,, x ,, x ,, ... | 140 | 71 |
| B.3353 x B.42231 ... | Noble x Glagah x Local x Chunnee | 178 | 71 |
| B.3439 x B.45237 ... | ,, x ,, x ,, x ,, | 159 | 70 |
| B.3439 x B.4744 ... | ,, x ,, x ,, x ,, | 15 | 10 |
| B.3439 x B.47419 ... | ,, x ,, x ,, x ,, | 499 | 220 |
| B.3439 x B.47310 ... | ,, x ,, x ,, x ,, | 90 | 40 |
| B.3439 x Co.290 ... | ,, x ,, x ,, x ,, | 248 | 90 |
| B.34102 x B.34104 ... | ,, x ,, x ,, x ,, | 90 | 50 |
| B.35207 x B.42231 ... | ,, x ,, x ,, x ,, | 70 | 37 |
| B.37161 x B.4098 ... | ,, x ,, x ,, x ,, | 700 | 322 |
| B.37161 x B.41211 ... | ,, x ,, x ,, x ,, | 400 | 120 |

## APPENDIX II (*Cont'd*)

### SUGAR CANE FIRST YEAR SEEDLINGS—B.55′ SERIES

**List of Crosses and Number of Seedlings of Each Planted in the Field Nursery (May 1953) and in the First Year Seedling Trial (October 1953)**

| CROSS | GROUP | No. Planted in Field Nursery | No. Planted in First Year Seedling Trial |
|---|---|---|---|
| B.37161 x B.47419 ... | Noble x Glagah x Local x Chunnee | 310 | 120 |
| B.37172 x B.47419 ... | ,, x ,, x ,, x ,, | 200 | 52 |
| B.39207 x B.4098 ... | ,, x ,, x ,, x ,, | 6 | 5 |
| B.39207 x B.41211 ... | ,, x ,, x ,, x ,, | 240 | 198 |
| B.39207 x B.4743 ... | ,, x ,, x ,, x ,, | 150 | 99 |
| B.4094 x B.41211 ... | ,, x ,, x ,, x ,, | 13 | 10 |
| B.4094 x B.41227 ... | ,, x ,, x ,, x ,, | 10 | 5 |
| B.4145 x B.34104 ... | ,, x ,, x ,, x ,, | 303 | 140 |
| B.4145 x B.39178 ... | ,, x ,, x ,, x ,, | 150 | 84 |
| B.4145 x B.4098 ... | ,, x ,, x ,, x ,, | 149 | 106 |
| B.4145 x B.4744 ... | ,, x ,, x ,, x ,, | 47 | 28 |
| B.4145 x B.47419 ... | ,, x ,, x ,, x ,, | 629 | 270 |
| B.42304 x B.34104 ... | ,, x ,, x ,, x ,, | 150 | 64 |
| B.4362 x B.34104 ... | ,, x ,, x ,, x ,, | 148 | 71 |
| B.4362 x B.39178 ... | ,, x ,, x ,, x ,, | 130 | 70 |
| B.4362 x B.4098 ... | ,, x ,, x ,, x ,, | 730 | 311 |
| B.4362 x B.40102 ... | ,, x ,, x ,, x ,, | 67 | 35 |
| B.4362 x B.42231 ... | ,, x ,, x ,, x ,, | 560 | 237 |
| B.4362 x B.46397 ... | ,, x ,, x ,, x ,, | 14 | 8 |
| B.4362 x B.4744 ... | ,, x ,, x ,, x ,, | 149 | 75 |
| B.4362 x B.47320 ... | ,, x ,, x ,, x ,, | 400 | 140 |
| B.4362 x B.47419 ... | ,, x ,, x ,, x ,, | 1,012 | 420 |
| B.4362 x B.4847 ... | ,, x ,, x ,, x ,, | 300 | 98 |
| B.4362 x Co.419 ... | ,, x ,, x ,, x ,, | 20 | 16 |
| B.4373 x B.39220 ... | ,, x ,, x ,, x ,, | 99 | 24 |
| B.4373 x P.O.J.2878 | ,, x ,, x ,, x ,, | 300 | 110 |
| B.44261 x B.603 ... | ,, x ,, x ,, x ,, | 20 | 10 |
| B.45170 x P.O.J.2878 | ,, x ,, x ,, x ,, | 240 | 92 |
| B.4726 x B.42231 ... | ,, x ,, x ,, x ,, | 64 | 30 |
| B.4733 x B.42231 ... | ,, x ,, x ,, x ,, | 50 | 22 |
| B.48330 x B.34104 ... | ,, x ,, x ,, x ,, | 250 | 100 |
| B.48330 x B.41211 ... | ,, x ,, x ,, x ,, | 199 | 100 |
| B.48330 x B.42231 ... | ,, x ,, x ,, x ,, | 450 | 200 |
| B.48330 x Co.290 | ,, x ,, x ,, x ,, | 240 | 112 |
| B.48330 x P.O.J.2878 | ,, x ,, x ,, x ,, | 170 | 60 |
| Co.421 x B.37193 ... | ,, x ,, x ,, x ,, | 810 | 161 |
| Co.421 x B.4098 ... | ,, x ,, x ,, x ,, | 770 | 261 |
| Co.421 x B.46223 ... | ,, x ,, x ,, x ,, | 410 | 150 |
| Co.421 x B.46397 ... | ,, x ,, x ,, x ,, | 556 | 160 |
| P.O.J.2878 x B.34104 ... | ,, x ,, x ,, x ,, | 137 | 45 |
| Ba.11569 x B.47151 ... | Noble x Glagah x Celebes x Chunnee ... ... ... ... | 5 | 0 |
| B.37161 x B.43391 ... | Noble x Glagah x Celebes x Chunnee ... ... ... ... | 29 | 7 |
| B.3439 x B.48177 ... | Noble x Glagah x Local x Celebes x Chunnee ... ... ... ... | 100 | 50 |
| B.43283 x B.41227 ... | Noble x Glagah x Local x Celebes x Chunnee ... ... ... ... | 150 | 53 |
| B.50151 x B.4098 ... | Noble x Glagah x Local x Celebes x Chunnee ... ... ... ... | 80 | 45 |
| Co.421 x B.43375 ... | Noble x Glagah x Local x Celebes x Chunnee ... ... ... ... | 700 | 246 |
| | | 20,493 | 8,061 |

## APPENDIX II (*Concluded*)

### SUGAR CANE FIRST YEAR SEEDLINGS—B.55′ SERIES

**List of Crosses and Number of Seedlings of Each Planted in the Field Nursery (May 1953) and in the First Year Seedling Trial (October 1953)**

| CROSS | | | GROUP | No. Planted in Field Nursery | No. Planted in First Year Seedling Trial |
|---|---|---|---|---|---|
| B.3365 | x B.603 | ... | *S. officinarum x S. barberi* 3rd Nobilisation Chunnee ... ... | 309 | 60 |
| | | | *S. officinarum x S. spontaneum x S. barberi x S. sinense* | | |
| B.39254 | x B.34104 | ... | Noble x Local x Chunnee x Sinense | 29 | 20 |
| B.50235 | x B.41227 | ... | Noble x Glagah x Chunnee x Sinense | 350 | 100 |
| B.39254 | x B.4738 | ... | Noble x Glagah x Local x Chunnee x Sinense ... ... ... | 24 | 15 |
| B.39254 | x B.4744 | ... | Noble x Glagah x Local x Chunnee x Sinense ... ... ... | 8 | 4 |
| B.39254 | x B.47419 | ... | Noble x Glagah x Local x Chunnee x Sinense ... ... ... | 50 | 30 |
| B.45152 | x B.37175 | ... | Noble x Glagah x Local x Chunnee x Sinense ... ... ... | 40 | 20 |
| B.45152 | x B.4098 | ... | Noble x Glagah x Local x Chunnee x Sinense ... ... ... | 78 | 40 |
| B.50235 | x B.4098 | ... | Noble x Glagah x Local x Chunnee x Sinense ... ... ... | 290 | 100 |
| | | | | 869 | 329 |
| | | | *S. officinarum x S. spontaneum x S. robustum* | | |
| B.3439 | x B.47157 | ... | Noble x Glagah x Celebes x Robustum ... ... ... | 300 | 99 |
| B.3439 | x B.47198 | ... | Noble x Glagah x Celebes x Robustum ... ... ... | 240 | 100 |
| B.3439 | x B.47199 | ... | Noble x Glagah x Celebes x Robustum ... ... ... | 148 | 29 |
| | | | | 688 | 228 |
| | | | GRAND TOTALS ... ... | 25,323 | 9,860 |